FINANCIAL STABILITY REPORT

2018 / 2019

CNB CZECH NATIONAL BANK

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The Financial Stability Report 2018/2019 was discussed by the CNB Bank Board at its regular meeting on financial stability issues on 23 May 2019 and published on 11 June 2019. Except for a few exceptions, it contains information available as of 31 March 2019. It is available in electronic form on the CNB website, where the underlying data for the tables and charts used in this publication are also published. Here you can also find the list of abbreviations.

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Maintaining financial stability is defined as one of the CNB's main objectives in Act No. 6/1993 Coll., on the Czech National Bank, as amended:

Article 2

(2) The Czech National Bank shall perform the following tasks:

...

e) set macroprudential policy by identifying, monitoring and assessing risks jeopardising the stability of the financial system and, in order to prevent or mitigate these risks, contribute by means of its powers to the resilience of the financial system and the maintenance of financial stability; where necessary, it shall cooperate with the relevant state authorities in setting macroprudential policy,

...

The CNB defines financial stability as a situation where the financial system operates with no serious failures or undesirable impacts on the present and future development of the economy as a whole, while showing a high degree of resilience to shocks. The CNB's definition is based on the fact that financial stability may be disturbed both by processes inside the financial sector that lead to the emergence of weak spots, and by strong shocks, which may arise from the external environment, domestic macroeconomic developments, large debtors and creditors, economic policies or changes in the institutional environment. Any interaction between weak spots and shocks can result in the collapse of systemically important financial institutions and in disruption of the financial intermediation and payment functions of the financial system.

The CNB's aim with regard to financial stability is above all to ensure a degree of resilience of the system that minimises the risk of financial instability. To fulfil this aim, the CNB as the central bank and supervisory authority uses the instruments made available to it by the Act on the CNB, the Act on Banks and other applicable laws. Cooperation with other national and international institutions is also very important in this area. In order to maintain financial stability, the CNB focuses on prevention and broad communication with the public regarding the potential risks and factors posing a threat to financial stability. This Financial Stability Report is an integral part of such communication.

The global financial crisis has led to a strengthening of the importance of the objective of financial stability in central banks. Macroprudential policy, which is intended to contribute to the maintenance of financial stability, was formally introduced in the Czech Republic in 2013 through an amendment of the Act on the CNB No. 227/2013 Coll. The main aim of macroprudential policy is to mitigate systemic risk, i.e. the risk of instability of the financial system as a whole. A debate about the tools of macroprudential regulation, i.e. the set of pre-emptive measures intended to prevent financial instability, is going on at international level. The European Systemic Risk Board (ESRB) has been operating at the European level since the start of 2011. Together with three pan-European sectoral supervisory authorities (EBA, ESMA and EIOPA) it makes up the European System of Financial Supervision (ESFS). If it identifies increased risks of a systemic nature, the ESRB issues warnings and recommendations to mitigate those risks. CNB representatives are involved directly in the ESRB's work; the CNB Governor and another board member are members of the General Board of the ESRB, and CNB experts participate in its working groups. Since 2011, the CNB has also been represented in the Regional Consultative Group of the Financial Stability Board established by the G20.

The CNB regularly monitors and closely analyses developments in all areas relevant to financial stability. The members of the CNB Bank Board meet with experts from key sections at regular meetings on financial stability issues. A wide range of information on developments of risks in the domestic financial system and abroad is presented at these meetings. The position of the Czech economy in the financial cycle is assessed and – if any risks to financial stability are identified – discussions are held regarding the use of regulatory, supervisory and other economic policy tools to suppress such risks or their potential effects.

Dear Readers,

Our main publication in the area of financial stability and macroprudential policy is the *Financial Stability Report*, which we have published every June since 2005. It is the key document for the regular spring Bank Board meeting on financial stability issues. The 15th Report – the **2018/2019** edition – is now at your disposal. I am sure you will welcome this opportunity to get again hold of information about this currently very important area of supervision and regulation. This year's FSR focuses mainly on the risks that may arise in connection with the movement of the domestic economy in the fourth year of the expansionary phase of the financial cycle. Significant space is devoted to instruments aimed at mitigating systemic risk arising in connection with mortgage lending and in particular to the first assessment of the effectiveness of the DTI and DSTI caps introduced in October 2018.

According to the Act on the CNB, maintaining financial stability is one of our key objectives. In accordance with the Act, the CNB identifies, monitors and assesses risks jeopardising the stability of the financial system and, in order to prevent or mitigate these risks, contributes by means of its powers to the resilience of the financial system and the maintenance of financial stability. It primarily employs macroprudential policy tools to do so.

The CNB defines financial stability as a situation where the financial system operates with no serious failures or undesirable impacts on the present and future development of the economy as a whole, while showing a high degree of resilience to shocks. The CNB's definition is based on the fact that financial stability may be disturbed both by processes inside the financial sector that lead to the emergence of weak spots, and by strong shocks, which may arise from the external environment, domestic macroeconomic developments, large debtors and creditors, economic policies or changes in the institutional environment. Any interaction between weak spots and shocks can result in the collapse of systemically important financial institutions and in disruption of the financial intermediation and payment functions of the financial system.

The CNB's aim with regard to financial stability is to ensure a degree of resilience of the system that minimises the risk of financial instability. To fulfil this aim, the CNB as the integrated supervisory authority and the central bank uses the instruments made available to it by the Act on the CNB, the Act on Banks and other applicable laws. Cooperation with other national and international institutions is also very important in this area. In order to maintain financial stability, the CNB focuses on prevention and broad communication with the public regarding the potential risks and factors posing a threat to financial stability.

The CNB regularly monitors and closely analyses developments in all areas relevant to financial stability. The members of the CNB Bank Board meet with experts from key sections at regular meetings on financial stability issues. A wide range of information on developments of risks in the domestic financial system and abroad is presented at these meetings. The position of the Czech economy in the financial cycle is assessed. If any risks to financial stability are identified, discussions are held regarding the possible use of regulatory, supervisory and other economic policy tools to suppress such risks or their potential effects.

The CNB is a member of the joint EU institution for the identification of systemic risks and macroprudential policy – the European Systemic Risk Board (ESRB). Together with three pan-European sectoral supervisory authorities (EBA, ESMA and EIOPA), the ESRB makes up the European System of Financial Supervision (ESFS). CNB representatives are involved directly in the ESRB's work; the CNB Governor and another

board member are members of the General Board of the ESRB, and CNB experts participate in its working groups. In line with an ESRB recommendation, macroprudential policy focuses on the fulfilment of several intermediate objectives. These objectives include (a) to mitigate and prevent excessive credit growth and leverage; (b) to mitigate and prevent excessive maturity mismatch and market illiquidity; (c) to limit direct and indirect exposure concentrations; (d) to limit the systemic impact of misaligned incentives with a view to reducing moral hazard; and (e) to strengthen the resilience of financial infrastructures. According to an ESRB assessment, the CNB is one of the most active authorities in the EU countries as regards the use of macroprudential policy at the national level.

The macroprudential policy instruments we use include above all a set of prescribed capital buffers for credit institutions. We set a countercyclical capital buffer and a systemic risk buffer for systemically important banks at regular intervals. In recent years, we have dealt intensively with risks associated with property market developments and mortgage lending. To mitigate these risks, we use a set of recommendations regarding the provision of mortgage loans. We are also pushing for a legislative change in this area, aimed at effective prevention of the relevant risks.

The FSR is based on an advanced analytical and modelling framework and contains a set of stress tests of individual segments of the financial sector and sectors of the real economy. The financial sector's resilience is tested by means of an adverse macroeconomic stress scenario entitled the *Adverse Scenario*. This scenario, whose probability is very low, describes the risk of a pronounced and long-lasting decline in domestic economic activity. The adverse economic situation will erode the financial reserves of households and non-financial corporations and cause a significant deterioration in their ability to service their debts. This will lead to sizeable credit losses in the banking sector. The *Adverse Scenario* also assumes a pronounced increase in long-term bond yields, which will result in financial institutions incurring losses due to market risk. The results of the tests performed on the basis of this stress scenario are compared with the *Baseline Scenario*, which is based on the CNB's official January forecast. The impacts of both scenarios are assessed not only from the perspective of the financial sector, but also with regard to the property market and the non-financial corporations and household sectors.

The publication is divided into five sections. The *Real economy and financial markets* section deals with the macroeconomic environment, property markets, corporations and households and analyses overall developments in the financial markets. The section called *The financial sector* discusses developments in the banking and non-banking financial sector. The *Stress tests* section assesses the resilience of sectors on the basis of stress tests and sensitivity analyses. The section *Macroprudential policy* contains an overall risk assessment, information on macroprudential instruments for mitigating risks identified, and an analysis of risks associated with developments in the regulatory environment.

The CNB will publish additional detailed analyses of risks to financial stability and information about the macroprudential policy settings in December 2019. It will do so in its regular document *Risks to financial stability and their indicators – December 2019*, which will be the underlying document for the autumn Bank Board meeting on financial stability issues.

On behalf of the Czech National Bank

Jiří Rusnok
Governor

BOXES

1 SUMMARY

The Czech financial sector has developed highly favourably since spring 2018. According to the CNB's aggregate assessment, it has maintained a high level of resilience to possible adverse shocks. As regards potential sources of risks to financial stability in the future, the Report overall finds a partial increase in risks associated with the financial and business cycle and an unchanged level of structural risks.

At its meeting on 23 May 2019, the CNB Bank Board decided to increase the countercyclical capital buffer rate to 2.0% with effect from 1 July 2020. The decision on the CCyB rate reflects a rise in risks associated with economic developments in the upward phase of the financial cycle and a slight increase in signals of vulnerability of the domestic banking sector to a potential adverse change in conditions. Assuming reasonable dividend policies, banks have sufficient space for a prospective increase in the CCyB and growth in their credit portfolios on the aggregate level.

With regard to estimates of house price overvaluation, the CNB regards the current LTV limits as upper bounds. However, it currently does not deem it necessary to tighten them. After the recommended DTI and DSTI limits entered into force in October 2018, the shares of loans in excess of the recommended levels of the two ratios started to head towards the 5% exemption. However, the adjustment process has not yet been completed and banks were non-compliant with the recommended limits overall in 2018 Q4. The CNB expects banks to comply with the limits in the first half of this year. Despite a small reduction of the room for interest rates on mortgage loans to rise sharply, the CNB Bank Board decided to leave the recommended cap on the DSTI ratio at 45%. At the same time, the CNB expects lenders to continue to be highly prudent in providing loans with DSTI ratios of between 40% and 45% given the conclusions of its analyses and stress tests demonstrating that loans with DSTI ratios of over 40% can be regarded as highly risky.

ASSESSMENT OF RISKS TO FINANCIAL STABILITY ASSOCIATED WITH THE REAL ECONOMY AND FINANCIAL MARKETS

Monetary and financial conditions in other countries remain very easy

Monetary policy rates remain low or negative in many European countries even in a situation of economic recovery and inflation only just below target levels. Monetary policy normalisation is slowing or being postponed outside Europe as well. The easy monetary and financial conditions are supporting a shift into the growth phase of the financial cycle, characterised by faster growth in loans and property prices. In response, macroprudential authorities in several EU countries have applied macroprudential instruments targeted at risks relating to lending for property purchase and to non-financial corporations. The CNB has made substantial progress with monetary policy normalisation, having increased its key monetary policy rate eight times since August 2017 to 2.0% in effect since May 2019. The CNB's monetary and macroprudential polices are thus working in a single direction and their countercyclical character is contributing to the stability of the domestic economy and the financial system.

Risk premia remain low and investors are demanding higher-yield assets with riskier profiles

Uncertainty regarding future economic developments is also visible on financial markets, where the volatility of the still relatively high asset prices has risen. However, risk premia remain very low, indicating a possibility of persisting overvaluation of financial assets. A sudden increase in financial market uncertainty and a related disorderly jump in risk premia could therefore lead to a relatively significant correction of share and bond prices and to losses on the part of their holders (banks, insurance companies and pension funds), as suggested by the swing on the financial markets seen in late 2018. Yields on domestic assets have rebounded from the record lows they reached in 2017 but remain below average by historical comparison. This is encouraging domestic institutional investors to allocate part of their portfolios to more profitable risky assets (shares, corporate bonds and commercial property). Negative real yields on deposit products are also motivating households to continue investing in higher-yield financial products – especially investment fund units – and to buy property on credit.

The debt of the Czech private non-financial sector is low and gradually rising

The debt of the domestic private non-financial sector relative to GDP rose by 1 pp year on year. At the end of 2018, it stood at 89% of GDP, which represents an increase of 13 pp over the last ten years. However, the debt-to-GNI ratio is higher at almost 96%, although this ratio has not been rising in recent years. The favourable trend in incomes is boosting optimism regarding future developments and raising demand for loans. The gradual growth in private sector debt in the Czech Republic could become a source of vulnerability in the medium or long term, even though the level of indebtedness it is still low by international comparison. In the event of an economic slowdown or recession, the higher debt level could negatively affect the depth and duration of the recession. The materialisation of external risks, associated mainly with the repricing of global risk premia, the high debt levels in euro area countries and potential structural changes in the global division of labour, can still be considered the most likely trigger of this scenario in the Czech Republic at the moment.

Developments in the non-financial corporations sector are being driven by a tight labour market and uncertainty regarding the global economy

The labour market showed persisting signs of overheating. A marked increase in compensation of employees was reflected in a decline in the gross operating surplus of the corporate sector and a further decrease in its profitability. The proportion of loss-making firms also increased considerably, especially in property development, manufacturing, and energy generation and distribution. A potential increase in protectionism in international trade, a cyclical cooling of the global economy, a marked slowdown of the Chinese economy and the unresolved issue of Brexit are the main risks that may adversely affect external demand and, in turn, the financial soundness of the sector. Another potential source of weaker financial soundness is persisting strong growth in wage costs, which would exert downward pressure on the corporate sector's profitability or reduce its competitiveness on the international scale.

Household debt remains relatively low, but some indebted households are relatively vulnerable

The debt-to-income ratio of households was flat at 61% in 2018. It is still relatively low in the European context and does not currently represent an immediate source of systemic risk. In the household stress test, this sector remained resilient to risks even in the *Adverse Scenario*. In particular, low-income households, whose debt service-to-income ratio has long exceeded 45%, were exposed to increased financial stress. According to the stress test results, this segment of households remains the most vulnerable group. In addition to a marked increase in unemployment and a drop in income, stronger growth in client interest rates remains a risk to the stability of the sector as a whole. For a significant proportion of households, it would mean a substantial worsening of their financial situation, starting at a debt service-to-net income ratio of 40%. However, this risk is partially mitigated by the current level of monetary policy interest rates and client interest rates in the Czech Republic.

Credit risk in the private non-financial sector continued to decline

Credit risk in the non-financial corporations sector, as measured by the 12-month default rate, has probably reached its cyclical trough. A decrease in credit risk measured in this way was also seen in the household sector, due to income growth and still relatively low debt servicing costs. Neither sector is likely to see any significant decrease in credit risk in the next few years. The non-performing loan ratio, measuring the materialisation of risks taken on in the past, followed the same pattern as credit risk, being flat in the case of non-financial corporations and decreasing slightly in the household sector. This decrease was due not only to positive economic developments, but also to strong credit growth, which contributed to an increase in the denominator of the indicator.

The banking sector maintained resilience to potential adverse developments with the aid of a voluntary capital surplus

The domestic financial sector showed favourable trends in 2018 and expanded in all segments. The banking sector strengthened its capitalisation and profitability and has high liquidity. Banks' high profitability and capitalisation is to a large extent conditional on very low asset impairment losses. Any contraction in the cycle could lead to a sharp rise in credit losses, a significant drop in profitability and growth in risk weights of credit portfolios, followed by a negative impact on banks' capitalisation. Capital buffers are an important element enhancing banks' resilience to such developments. The stress tests of

the banking sector confirmed its capital and liquidity resilience to the *Adverse Scenario*. The sector's aggregate capital ratio remained almost constantly above 19% over the three-year test horizon in the *Baseline Scenario*. However, the capital surplus held voluntarily by banks contributed significantly to keeping the overall capital ratio above the 8% regulatory threshold over the test horizon in the *Adverse Scenario*. Its potential use to cover the minimum requirement for own funds and eligible liabilities (MREL) may have a significant effect on the assessment of the resilience of systemically important banks in the future. The test methodology does not include the potential sectoral tax under discussion by the government at the time the tests were processed. Its introduction would partially limit the ability of some institutions to top up their capital using retained earnings.

The insurance sector could contribute a decline in domestic financial asset prices in the event of adverse developments

Insurance companies maintained their capitalisation and profitability in a situation where financial market developments adversely affected their assets and liabilities. The domestic insurance sector's resilience to adverse shocks at the three-year horizon was also confirmed by a new macro stress test. Insurance companies should thus not be a source of systemic risk. However, sell-offs of domestic financial assets by insurance companies could cause their prices to fall in the event of adverse economic developments.

Pension management companies and investment funds are vulnerable to market developments

The segments of pension management companies and investment funds were hit by changes in the prices of some of their assets at the end of 2018. However, this did not lead to an exodus of planholders and investors or to systemically important losses. The greater sensitivity of the segments of pension and investment funds to financial market developments and changes in asset prices requires high-quality management of market and liquidity risks to maintain long-term confidence among participants, investors and clients. Financial market developments in 2018 led to a decline in the excesses of assets over liabilities of pension management funds' transformed funds. This means that even slightly unfavourable market developments in the form of an increase in government bond yields and risk premia may force pension management companies to cover investment losses in transformed funds in the future. However, the stress tests of pension management companies at the one-year horizon show that the intensity of this risk diminished year on year due to an increase in market yields.

The risks associated with public finances remain low

Czech government debt declined again year on year and is small by European comparison as a percentage of GDP. Financial risk decreased also due to an increase in the average residual maturity of government debt. The CNB continues to regard credit institutions' exposures to the Czech government as systemically important. Given the favourable results of the Czech public finance stress test, however, the CNB will not require credit institutions to meet an additional capital requirement to cover the risk of concentration of these exposures over a three-year horizon.

MACROPRUDENTIAL POLICY

The CNB responds to risks in the banking sector associated with the financial and business cycle by setting the countercyclical capital buffer

The countercyclical capital buffer (CCyB) is designed to increase the resilience of the banking sector to risks associated with the effect of the financial cycle. One of the manifestations of an expansionary phase of the cycle in the real economy is higher cyclical risk-taking, accompanied by strong credit growth, growth in debt and a very low default rate. In the event of a downturn in the financial cycle, accumulated risks may materialise and credit losses may increase, affecting banks' capital. Another feature of an upward phase of the financial cycle is growth in the banking sector's vulnerability due to cyclically low provisioning and/or decreasing risk weights. An economic downswing results in them returning to higher levels, which is adversely reflected in banks' capital ratios. An appropriately set CCyB rate should help reduce the negative impacts of these manifestations of the financial cycle on the banking sector, maintain the supply of bank credit and prevent transmission of an additional shock to the real economy. The CNB set the CCyB rate at 0.5% at the end of 2015 and has

increased it five times since then. At the time of publication of this FSR, the CCyB rate applied to exposures in the Czech Republic is 1.25%. Over the last year, the CNB Bank Board decided to increase it to 1.5% with effect from July 2019 and 1.75% with effect from January 2020.

Consistent with the assessment of cyclical risks and the degree of vulnerability of the banking sector at the Bank Board meeting in May is an increase in the countercyclical capital buffer rate to 2.0%.

The final decision on the CCyB rate is always a result of a comprehensive assessment of indicators of the financial cycle and the vulnerability of the banking sector and other factors affecting the sector's resilience. Following this assessment, the CNB Bank Board decided at its meeting on 23 May 2019 to increase the CCyB rate to 2.0% with effect from 1 July 2020. Most banks are compliant with the overall capital requirement, consisting of the minimum regulatory level in Pillar 1, the requirements based on the supervisory review of risks in Pillar 2 and capital buffers, by a sufficient margin. Assuming reasonable dividend policies, banks have sufficient space for a prospective increase in the CCyB and growth in their credit portfolios on the aggregate level. Given that the domestic economy is probably close to the peak of the financial cycle, the likelihood of a further increase in the countercyclical capital buffer rate has significantly decreased.

The domestic economy has moved slightly further into the growth phase of the financial cycle

The starting point for the Bank Board's decision on the CCyB rate is an assessment of the position of the domestic economy in the financial cycle. According to the aggregate Financial Cycle Indicator, the domestic economy entered the fourth year of the expansionary phase at the end of last year. This situation usually sees higher cyclical risk-taking, which may result in higher credit losses if economic conditions deteriorate. The prudential estimate of these losses is around CZK 26 billion in the current phase of the financial cycle. The fact that a relatively large volume of loans with worsened risk characteristics was provided in the second half of 2018 was also taken into account. This mainly concerns mortgage loans with high DTI and DSTI ratios and loans to finance commercial property purchases and construction, and also loans to the non-financial corporations sector, which saw a fall in profitability and a rise in the number of loss-making firms. The vulnerability of the banking sector also usually increases in the upward phase of the financial cycle. It is manifested in a low default rate and near-zero asset impairment losses. This is reflected in a decline in risk weights of the main IRB credit portfolios. The current absolute capital requirement for IRB portfolios would be CZK 24 billion higher based on the risk weights observed at the start of the expansionary phase. The sum of these effects represents an absolute volume of capital of CZK 50 billion. This would imply a CCyB rate of 2.0% relative to the value of risk-weighted assets as of the end of 2018 (CZK 2,514 billion). Provisioning is an additional indicator of vulnerability. The ratio of provisions to total loans continued to follow a downward trend for most of 2018.

Materialisation of cyclical risks and growing tensions in financial markets will be the key signal to lower the CCyB rate

The CNB stands ready to lower or completely zero the CCyB rate in the event of a sudden turnaround in the financial cycle. However, a gradual decrease in lending activity or more prudential lending will not constitute a reason for lowering the CCyB rate, as the cyclical risk assumed at times of above-average credit growth and relaxed credit standards stays in banks' balance sheets. Clear signals of increased risk materialisation, reflected in rising risk weights, growing costs of risk and increased provisioning leading to a decline in profitability and the capital ratio, will be grounds for reducing the CCyB rate. A weakening credit supply and its causes will be another important factor when deciding to release the buffer. Indicators of stress in financial markets may be a leading or parallel signal of this. The process of lowering the CCyB rate will be timed carefully. A very early reduction would increase the banking sector's capital surplus, which might not be used prudently to cover future losses and the draining of which might further increase the sector's vulnerability. Conversely, releasing the buffer too late could result in a credit crunch and would render it impossible to smooth the downward phase of the financial cycle.

Credit financing of housing is a source of systemic risks

Previous *Financial Stability Reports* identified a spiral between credit financing of residential property and rapidly rising residential property prices as a significant source of systemic risks in the Czech economy. Genuinely new housing loans

increased gradually in 2018 H1 and then picked up significantly, fostering a renewed rise in property price inflation in 2018 H2. This was reflected in worsening housing affordability. The spiral between credit financing of property purchases and optimistic expectations of a future rise in the value of property thus started to intensify slightly again after having slowed in the previous quarters. Buoyant wage growth and favourable financial conditions for purchasing property are continuing to boost the attractiveness of investing in housing. The sustained property price growth may be increasing the incentive for some households to buy property on credit and encouraging them to take on excessive debt in relation to income. A risk scenario going forward is therefore a situation where a large proportion of households start to consider the current income growth to be permanent and succumb to the illusion that it will be easy to service increasing debt levels. Another risk is a situation where households start to believe that house prices will continue to rise indefinitely. According to the CNB's analyses, apartment price overvaluation grew slightly further in 2018 H2 and currently stands at around 15%. The currently observed property prices may not be sustainable in the long run.

The CNB is responding to the risks associated with credit financing of housing by applying macroprudential policy instruments

Since 2015, the CNB has been applying instruments to mitigate risks associated with the provision of retail loans secured by residential property as formulated in its *Recommendation on the management of risks associated with the provision of retail loans secured by residential property* (the "Recommendation"). The CNB currently recommends that lenders should not provide such loans with LTVs of over 90% and should limit the provision of loans with LTVs of 80%–90% to 15% of new loans in the quarter. Since October 2018, the CNB has also advised lenders not to exceed a debt-to-net income (DTI) ratio of nine annual incomes and a debt service-to net income (DSTI) ratio of 45%. The Recommendation also sets maximum loan maturities, selected parameters for stress testing applicants and qualitative criteria for prudent provision of loans. The CNB assesses the risks associated with mortgage lending and banks' compliance with the Recommendation twice a year.

The setting of DTI and DSTI caps led to a fluctuation in the provision of mortgage loans

The high volumes of new mortgage loans provided in 2018 H2 to some extent reflected efforts to obtain loans in the months just before the recommended DTI and DSTI caps were introduced. As expected, new loans dropped at the end of 2018 and in the first few months of 2019. This was probably a result not only of the macroprudential measures adopted and the frontloading effect, but of growth in client interest rates and a drop in housing affordability. The true impact of the DTI and DSTI caps on the amount of mortgage loans provided cannot be assessed at the moment. An assessment conducted on the basis of data on loans provided in 2018 H2 shows that some loans provided last year had highly risky characteristics. The scale of loans with such characteristics started to fall after the introduction of the DTI and DSTI caps. The CNB expects the above factors, combined with the effect of last year's base, to foster a drop in new mortgage loans in 2019 as a whole.

Banks are mostly compliant with the recommended LTV limits and the CNB considers the current limits to be sufficient

Banks are broadly compliant with the Recommendation in force as regards LTV limits. The share of loans with LTVs of 80%–90%, which can account for a maximum of 15% of new loans, decreased slightly further, reaching 9% in December 2018. Banks provided some loans with an individual LTV limit of over 90%, the level above which loans should not be provided under the Recommendation. However, the total share of these loans remained low, falling below 2% of new loans in 2018 Q4. Although most credit institutions are compliant with the recommended LTV limits, some tendencies may indicate that in good times lenders tend to value collateral on the basis of current market prices, regardless of the fact that those prices may be overvalued in an upward phase of the cycle. With regard to its estimate that house prices are overvalued by around 15%, the CNB regards the current LTV limits as upper bounds. The CNB does not deem it necessary to tighten the limits immediately. However, continued growth in house price overvaluation could necessitate a reassessment of the sufficiency of the current limits.

The DTI and DSTI distributions of new loans indicate increased risk-taking

In 2018 Q3 – immediately before the recommended DTI and DSTI caps took effect – credit institutions were lending to a significant extent to clients who had high additional debt service. Following the introduction of the recommended limits in October 2018, this trend was reversed and the shares of loans in excess of the limits started to decline towards the 5%

exemption. However, the adjustment process has not yet been completed and institutions were non-compliant with the recommended limits overall in 2018 Q4. The share of loans with DSTIs of over 45% exceeded 24% of loans provided in 2018 Q3 and fell to less than 12% in 2018 Q4. Loans with DTIs exceeding the recommended limit of 9 accounted for almost 12% of loans provided in 2018 Q3, with the share declining to around 6% in 2018 Q4. A reduction in the supply of loans to clients with higher additional debt can be regarded as the main channel for adjustment to the recommended limits for both ratios. This is indicated by the distributions of loans according to risky LTI and LSTI levels. These were well below the shares of loans in excess of the limits until the upper DTI and DSTI limits took effect. However, the two types of indicators converged in 2018 Q4 (with LTI and LSTI falling much less than DTI and DSTI). Another possibility is a higher number of loan applicants who together have a higher income.

The CNB is leaving the upper DTI and DSTI limits unchanged

The DSTI ratio is more restrictive for mortgage applicants and providers. Capping this ratio is crucial in a situation where interest rates on mortgage loans fall to exceptionally low levels. This occurred in the domestic economy particularly in 2016 and 2017, when average rates on new mortgages stood at around 2% or even lower. These rates started to rise in 2018, approaching 3% at the end of the year. In 2019 Q1, by contrast, they declined slightly. As a result, the potential room for them to rise sharply has been partly reduced and the risk of a surge in debt service has decreased. However, the extent of this reduction is still small. This, together with insufficient compliance with the current DSTI limit of 45%, makes an increase in the cap on this ratio impossible. At the same time, the CNB expects lenders to be highly prudent in providing loans with DSTI ratios of between 40% and 50% given the conclusions of its analysis and stress tests showing that loans with a DSTI of more than 40% can be regarded highly as risky.

The CNB has made several technical changes to the Recommendation

On the basis of discussions with mortgage providers, the CNB has redefined the reference volume of loans used as the base for calculating the volume of new loans subject to exemptions from the LTV, DTI and DSTI limits. The reference volume is now one-half of the sum of all retail loans secured by residential property provided in the two previous quarters or one-half of the sum of other consumer credit not secured by residential property provided in the two previous quarters. The CNB has also clarified the provision on the refinancing of consumer credit not secured by residential property for clients who already have a retail loan secured by residential property and are simultaneously increasing the outstanding principal of the unsecured loan by more than 10% as part of the refinancing process. In such cases, lenders should always assess whether clients' total debt satisfies the recommended DTI and DSTI limits.

The CNB is seeking the statutory power to set upper limits on the LTV, DTI and DSTI ratios for mortgage loans

The CNB and the Czech Ministry of Finance have submitted into the legislative process an amendment to the Act on the CNB that would empower the CNB to set upper LTV, DTI and DSTI limits in a legally binding manner through provisions of a general nature. All three ratios are regulated by the current Recommendation. A switch to setting these indicators in a legally binding manner will therefore have no major impact on current bank providers of these loans or on consumers. However, the limits must be legally binding in order to ensure a level playing field on the market and to prevent unfair competition between lenders in the future if new (especially non-bank and foreign) players enter this market segment, as enforcement of the rules set out in the Recommendation would not be as effective for them as it is for domestic banks.

The CNB will publish additional detailed analyses of risks to financial stability and information about the macroprudential policy setting in December 2019 in its regular document *Risks to financial stability and their indicators – December 2019*, which will be an underlying document for the autumn Bank Board meeting on financial stability issues.

2 THE REAL ECONOMY AND FINANCIAL MARKETS

The growth of the world economy has slowed. The process of monetary policy normalisation by key central banks has almost come to a halt, owing to a worse economic outlook and weak inflation pressures, while global financial conditions remain easy. The prolonged period of low interest rates in most European economies is postponing the materialisation of the accumulated risks to financial stability and is simultaneously encouraging the taking on of new risks, associated with rising private and government debt and growth in financial asset prices above their fundamental levels. The domestic economy expanded by just under 3% in 2018. The CNB forecast expects continued growth of around 2.5% in 2019. Long-term Czech government bond yields stayed below their neutral levels. Prices of commercial and residential property increased further and remained overvalued. The profitability of non-financial corporations continued to decline due to rising wage costs. High credit activity was reflected in a substantial increase in corporate indebtedness. In the household sector, the debt-to-income ratio did not rise, but continued buoyant credit growth was observed in this sector as well.

Global repricing of risk premia and a related sudden increase in longer-term interest rates remained a significant risk to the stability of the domestic financial system. The materialisation of external risks in the shape of an economic slowdown in the euro area would also be reflected in lower growth of the domestic economy. A sizeable decrease in demand for goods and services would have a negative impact on firms' profitability and households' wages and would lead to higher default rates.

2.1 THE MACROECONOMIC AND FINANCIAL ENVIRONMENT

2.1.1 The External Environment

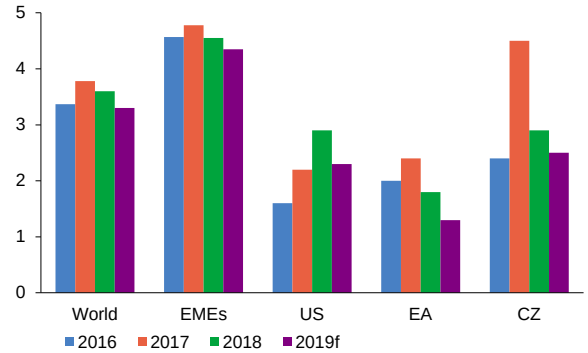
Global economic growth was favourable in 2018, but outlooks indicate a slowdown…

The world economy grew by a solid 3.6% in 2018 (as against 3.8% in 2017). The April IMF forecast expects a slowdown to 3.3% this year and a gradual recovery in the following years. Growth in advanced economies began to slow during 2018, and the outlooks for this year steadily worsened (see Chart II.1). The euro area recorded annual GDP growth of 1.8% in 2018. The April IMF forecast and the March ECB forecast indicate a slowdown in euro area growth to 1.3% and 1.1% respectively this year. Persisting high political uncertainty combined with protectionist US trade policy, the manner of Brexit and the slowdown of the Chinese economy were also reflected in a decline in leading indicators and the confidence of economic agents regarding future economic developments in the EU (see Chart II.1 CB). The 2019 economic growth outlooks for most EU countries were revised downwards (see Chart II.2 CB).

Chart II.1

Economic growth in selected countries

(annual real GDP growth in %)

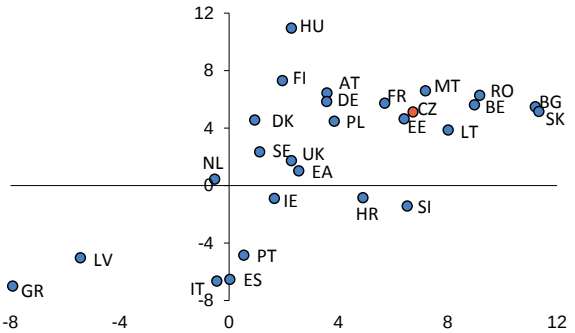


Source: IMF (World Economic Outlook, April 2019), CNB
Note: f = forecast. The forecast for the Czech Republic is based on the CNB forecast published in Inflation Report II/2019.

Chart II.2

Credit growth in selected EU countries in 2018

(%; x-axis: households; y-axis: non-financial corporations)



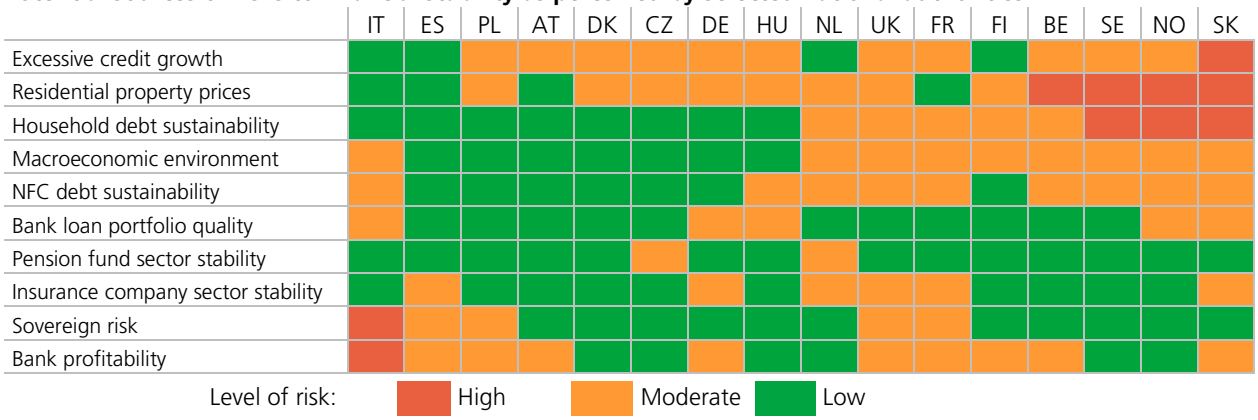
Source: ECB, CNB calculation
Note: Credit comprises loans provided by credit institutions and is expressed in EUR. For this reason, the data on credit growth in this chart may differ from those in other parts of this Report or those reported by other institutions. Year-end data.

…credit growth in the EU remains strong and some macroprudential authorities now view the private sector debt level as risky

Economic growth and sources of risks remain mixed across the EU countries. A number of economies are in a highly expansionary phase of the financial cycle accompanied by increased credit dynamics, rapid growth in residential property prices, rising private non-financial sector debt and investment optimism (see Table II.1). Twelve of the sixteen EU countries covered in the table considered the current rate of credit growth to be moderately or highly risky. The annual growth rate of loans to households was above 6% in 2018 Q4 in ten EU countries; in the case of loans to non-financial corporations, six EU countries exceeded this level (see Chart II.2). One-year growth in residential property prices exceeded 5% in twelve EU countries (see Chart II.3). In recent years, favourable financial conditions and solid economic growth have enabled a decline in the debt ratios of the government and non-financial corporations in some EU countries. In a few countries, however, debt ratios increased to all-time highs in 2018 (see Chart II.4). National authorities in one-half of the selected countries now viewed the risks associated with private sector debt as moderate or even as high in the case of the household sector (see Table II.1). In many countries, private sector debt is closely linked with general government debt and the country's liabilities to the rest of the world. A highly indebted government sector without sufficient room to increase fiscal expenditure cannot act in a countercyclical manner and help dampen the impact of the materialisation of private sector credit risk. Government debt increased in 18 EU countries in 2010–2018 and a debt-to-GDP ratio exceeding 60% was recorded in 15 EU countries in 2018 (see Chart II.3 CB).

Table II.1

Potential sources of risks to financial stability as perceived by selected national authorities



Source: The relevant countries' latest financial stability reports, ESRB Risk Dashboard, CNB
Note: The assessment is based on a qualitative evaluation of the relevant countries' latest financial stability reports. Where a risk is not mentioned in the report, the assessment is based on the CNB's interpretation of the indicators used in the ESRB Risk Dashboard. The ordering of countries and risks in the table is obtained using a visual contrast-optimising algorithm.

Highly indebted countries are more vulnerable to an increase in interest rates and risk premia

Countries with high debt in the private non-financial sector or government sector, or in both these sectors simultaneously, are more vulnerable to a rise in interest rates and risk premia and to a sharper economic downturn (see Box 2.1). The weakening economic activity is creating potential for growth in the credit losses of the European banking sector.[1] Concerns regarding contagion via direct or indirect channels from countries with high sovereign risk are also increasing.

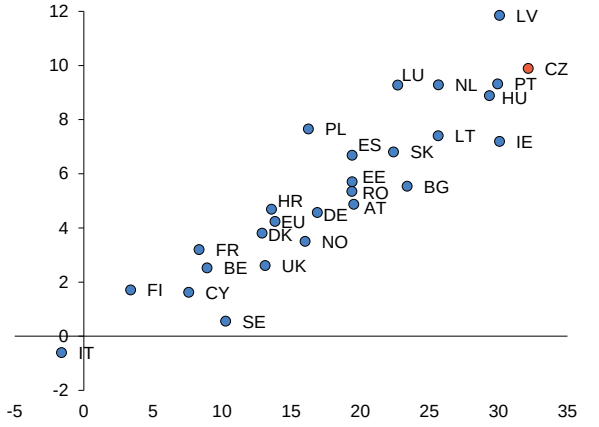
1 The EU banking sector continues to face low profitability and a high degree of problem loans on balance sheets (EBA: Report on risks and vulnerabilities in the EU financial system, March 2019). The ECB aims to reduce the level of NPLs – in March 2018 it issued guidance for banks stating that unsecured and secured loans should be 100% covered by provisions two years and seven years respectively after their classification as non-performing (Addendum to the ECB Guidance to banks on non-performing loans: supervisory expectations for prudential provisioning of non-performing exposures, March 2018).

A sudden jump in credit premia in countries with highly indebted government sectors could lead not only to problems with refinancing the financial[2] and non-financial sectors in the country concerned, but also to contagion across EU countries.

Chart II.3

Property price growth in selected EU countries in 2018

(%; x-axis: three-year growth; y-axis: one-year growth)

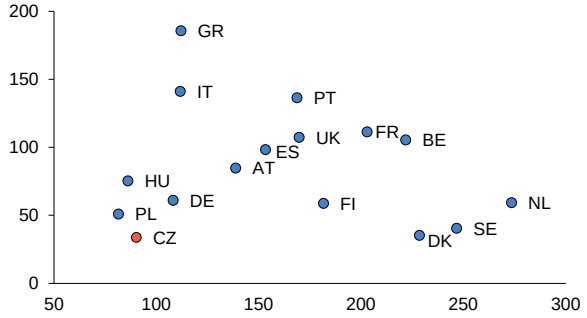


Source: Eurostat
Note: Due to high values, the chart does not show Slovenia (three-year and one-year growth of 38.95% and 18.20% respectively). Year-end data.

Chart II.4

Private and government debt in selected EU countries in 2018

(% of GDP; x-axis: private sector debt; y-axis: government debt)



Source: BIS, CNB
Note: Debt is the sum of all credit provided by domestic banks, non-banks and non-residents. The private sector comprises non-financial corporations, households and NPISHs. The BIS debt calculation methodology may differ from the methodologies used by national authorities. For this reason, the data in the chart may differ from those reported by other institutions. The debt figure is as of 2018 Q3.

BOX 2.1: CHANGES IN NON-FINANCIAL SECTOR DEBT AFTER THE GLOBAL FINANCIAL CRISIS

The global financial crisis generated strong disinflationary pressures, to which central banks naturally responded by pursuing a policy of exceptionally low interest rates and in some cases also quantitative easing. It was assumed that this policy would enable the private sector in particular to reduce its debt, which is regarded as one of the major causes of the crisis. Ten years on, we can say that no overall decrease in debt has been observed in advanced or emerging economies (see Chart II.1 Box). Advanced economies have mostly seen an increase in government debt, which in most of the countries under review has exceeded the stagnation or decline in private debt (see Chart II.2 Box). In emerging economies, private sector debt has increased significantly. A reversal of the rising debt trend has occurred in recent years owing to higher economic activity being reflected in faster nominal income growth.

The debt trends have differed substantially across the countries monitored and between the sectors of households and non-financial corporations. In many advanced countries, including the USA, write-offs of non-performing loans after the global crisis, falling property prices and macroprudential measures focused on mortgage loans have been reflected in a decline in household debt (see Chart II.3 Box). By contrast, cheap and available funding has motivated the corporate sectors in many countries to increase their leverage. However, the rise in private non-financial sector debt has often not been accompanied by a rise in debt service (see Chart II.4 Box). On the contrary, debt service has fallen significantly in some of these countries (see Chart II.4 Box, bottom-right quadrant). The main reason is

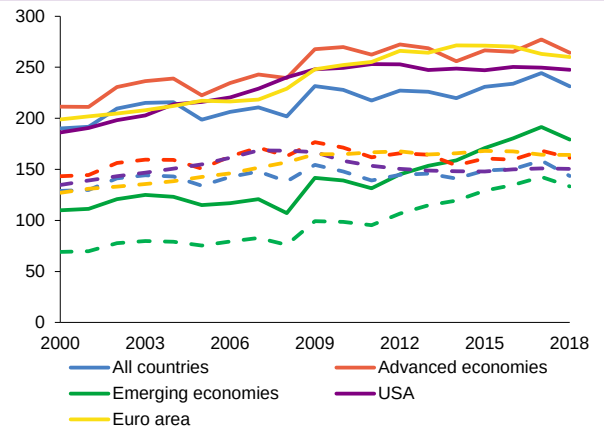
2 In the second half of 2018, increasing political uncertainty in Italy caused government bond yields to rise sharply. The increase immediately passed through to the Italian banking sector through wider CDS spreads and a drop in the share prices of Italian banks (IMF, GFSR, The euro area sovereign-financial sector nexus, April 2019).

a decrease in global interest rates, due partly to key central banks maintaining their monetary policy rates at exceptionally low levels by historical standards (see Chart II.5). At the same time, however, this situation has become a source of relatively strong risk for some countries, as an increase in interest rates on loans would be reflected in a significant rise in debt service. Coupled with a larger decrease in economic growth, this would adversely affect demand for goods and services and lead to a higher default rate among households and non-financial corporations.

Chart II.1 Box

Non-financial sector debt after 2000

(% of GDP)

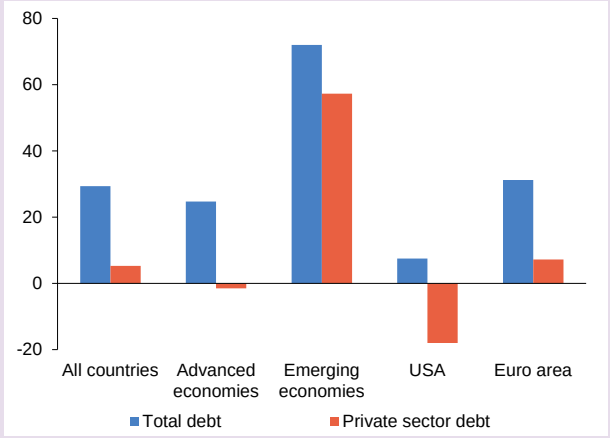


Source: BIS
Note: The solid lines denote total debt (i.e. including the government sector) and the dashed lines private non-financial sector debt. The data are for 43 countries covered by credit statistics available on the BIS website.

Chart II.2 Box

Changes in non-financial sector debt (2008–2018)

(pp)

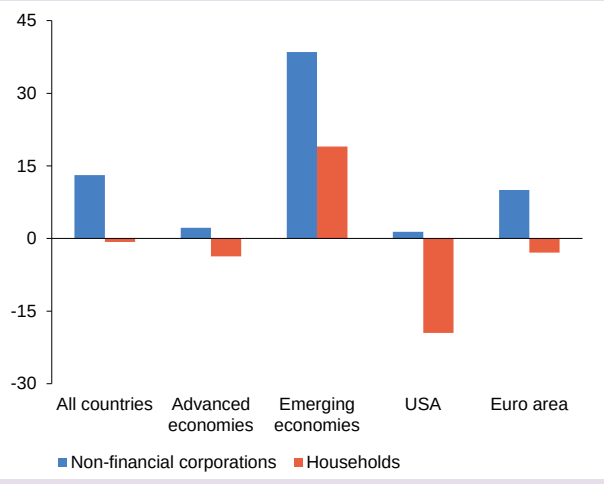


Source: BIS
Note: The data are for 43 countries covered by credit statistics available on the BIS website.

Chart II.3 Box

Changes in the debt of households and non-financial corporations (2008–2018)

(pp)

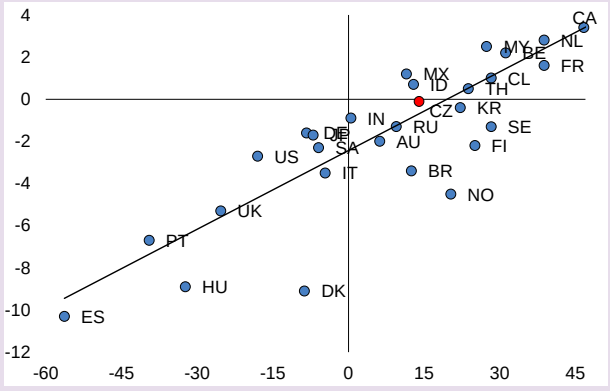


Source: BIS
Note: The data are for 43 countries covered by credit statistics available on the BIS website.

Chart II.4 Box

Changes in the debt and debt service of the private non-financial sector (2008–2018)

(pp; x-axis: change in debt; y-axis: change in debt service ratio)



Source: BIS
Note: The data are for 32 countries covered by debt service statistics available on the BIS website. Debt and debt service are expressed as a percentage of GDP. The Czech Republic is plotted in red. Due to high values, the chart does not show Turkey (changes in debt and debt service of +48.1 pp and +16.6 pp respectively), China (+89.1 and +7.5 respectively) and Hong Kong (+112.6 and +7.9 respectively).

Global monetary conditions are tightening only very slowly and remain very easy in the euro area

Monetary policy normalisation is slowing or being postponed. With the exception of the US Fed, key central banks are keeping monetary policy rates very low (see Chart II.5). The Fed has emphasised that it will proceed patiently and gradually with its future interest rate increases. According to the median of its members' projections, rates can be expected to be stable until the end of 2019.[3] The ECB expects its monetary policy rates to stay at the current levels at least until the end of this year. In December 2018, the ECB ended its asset purchase programme after four years.[4] In March 2019, however, it decided to introduce a new round of operations to provide long-term liquidity to banks.[5] Monetary conditions in the euro area will thus remain exceptionally easy for at least one year. However, the prolongation of the period of low interest rates by key central banks may postpone the materialisation of the accumulated risks to financial stability and additionally encourage the taking on of new risks, associated with increasing private and government debt (see Box 2.1) or growth in asset prices above their fundamental levels.

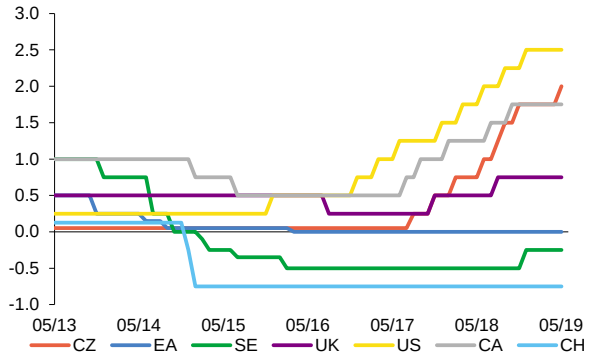
The expected slowdown in global growth is reflected in higher financial market uncertainty

Uncertainty regarding future economic developments is also visible on financial markets, where the volatility of the still relatively high asset prices has risen. This was apparent in December 2018, when a combination of worse macroeconomic data and the message of the Fed forecast caused panic among investors regarding an end of growth in financial asset prices, and led to a significant correction, especially on stock markets. The VIX volatility index jumped to double the previous level, the S&P 500 fell by 19% and the European MSCI Euro dropped by 7%. The increase in market uncertainty was also linked with an inversion of US yield curves, which is a traditional warning sign for the markets concerning a potential future weakening of the economy (see Chart II.5 CB). Since the publication of FSR 2017/2018 in June 2018, a global rise in the risk premium for corporate bonds has also occurred (see Chart II.6 CB). The global market situation calmed somewhat in January this year, owing mainly to the dovish tone of the Fed's communications, but the risk of a sizeable reaction of market prices in the event of additional bad news persists.

Chart II.5

Main monetary policy rates of selected central banks

(%)

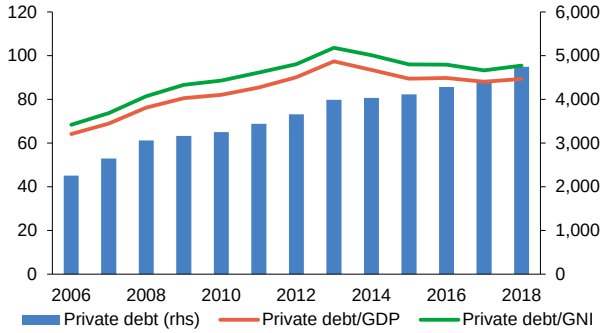


Source: Thomson Reuters

Chart II.6

Private non-financial sector debt in the Czech Republic

(%; right-hand scale: CZK billions)



Source: CNB, CZSO
Note: The private sector comprises households, non-financial corporations and NPISHs.

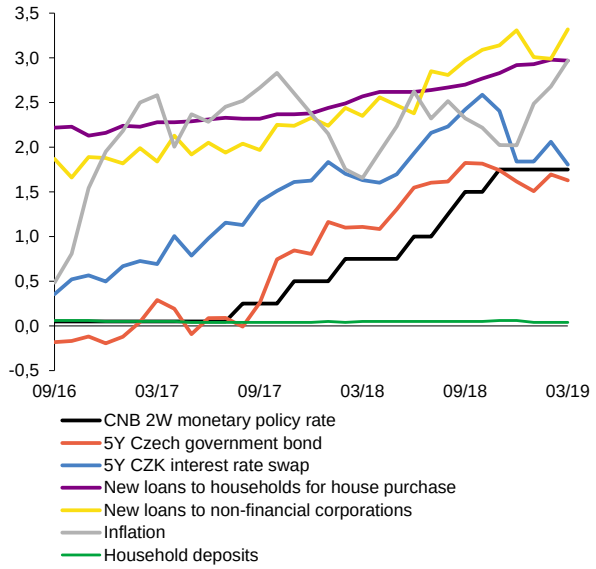
3 Minutes of the Federal Open Market Committee, March 2019.
4 The asset purchase programme ended after four years. The ECB will continue to reinvest the principal payments from maturing securities purchased under the asset purchase programme. By February 2019, 27% of the outstanding amount of the euro-denominated government bonds of the euro area countries were held on ESCB balance sheets (ECB Asset purchase programmes).
5 The new quarterly TLTRO III operations with a two-year maturity will run from September 2019 to March 2021. Under TLTRO III, banks will be entitled to borrow up to 30% of the stock of eligible loans as at 28 February 2019 at a rate indexed to the interest rate on the main refinancing operations over the life of each operation (Monetary policy decisions, March 2019).

2.1.2 The Domestic Environment

The domestic economy continues to grow, with private non-financial sector debt also increasing

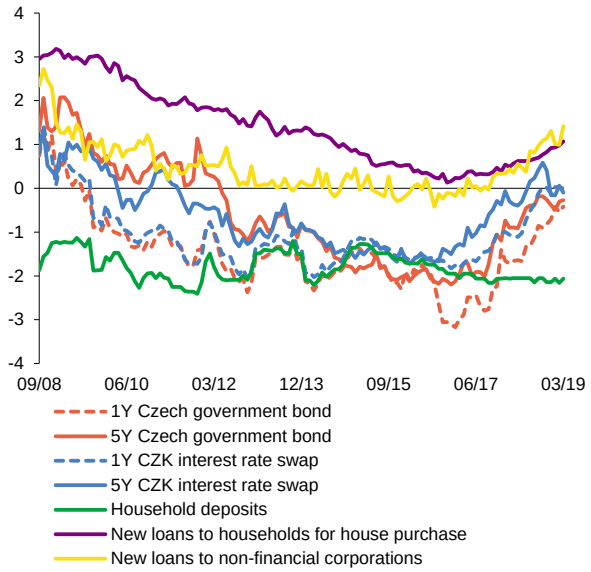
The growth of the domestic economy slowed to less than 3% in 2018. The CNB forecast contained in Inflation Report II/2019 expects year-on-year GDP growth of around 2.5% this year. The favourable development of the domestic economy was due to investment, government expenditure and robust household consumption. The last-mentioned reflected rapid growth in disposable income amid low unemployment. Total private sector debt increased in line with the observed growth of the domestic economy (see section 2.2). The absolute debt level of the private non-financial sector in the Czech Republic rose relatively rapidly, but relative debt remained virtually stable thanks to the buoyant income growth (see Chart II.6). The debt of the domestic private non-financial sector relative to GDP rose by more than 1 pp to almost 89% of GDP at the end of 2018. This represents an increase of 13 pp over the last ten years. However, the debt-to-GNI ratio is higher at almost 96%, although this ratio has not been rising in recent years. The gradual growth in the private sector debt in the Czech Republic could give rise to a structural risk in the medium or long term, particularly if national income was to grow insufficiently. In the event of an economic slowdown or recession (see Chart II.17A), the higher debt level could negatively affect the depth and duration of the recession. The materialisation of external risks, associated mainly with the repricing of global risk premia and with the high debt levels in euro area countries, can still be considered the most likely trigger of a deep recession at the moment.

Chart II.7
Selected interest rates, yields and inflation
(%)



Source: CNB
Note: Month-end values are used, except for client rates, where monthly averages are used instead.

Chart II.8
Real yields and interest rates
(%)



Source: CNB
Note: Real yields and interest rates are calculated as the difference between nominal yields/rates and expected inflation. Expectations one year ahead are considered for the 1Y Czech government bond, the 1Y CZK interest rate swap and household deposits. Expectations three years ahead are considered for the other yields and rates.

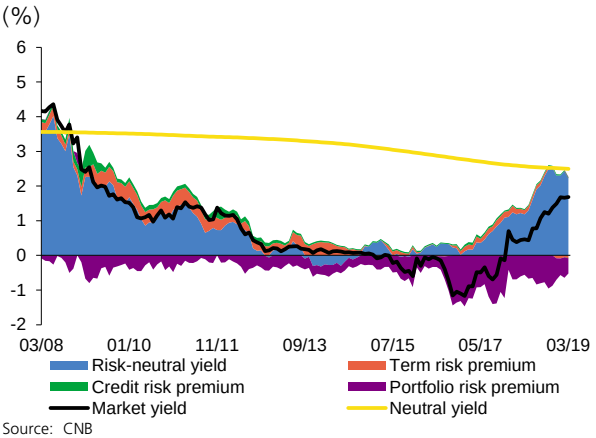
The monetary policy tightening by the CNB has been reflected in growth in market interest rates, while risk premia remain low

The CNB has raised its monetary policy rate four times since mid-2018. The rate has thus risen by 100 basis points to 2% (see Chart II.5). The growth in the monetary policy rate has been reflected in a rise in the five-year Czech government bond yield, the five-year koruna interest rate swap, the average interest rate on loans to households for house purchase and the average interest rate on loans to non-financial corporations (see Chart II.7), and has resulted in Czech government bond

yields nearing their neutral levels[6] (see Chart II.9 and Chart II.10). However, a stronger rise in yields is being hindered by persisting low risk premia. The growth in nominal rates and yields was reflected in growth in real yields (calculated as the difference between nominal rates/yields and expected inflation; see Chart II.8) in 2018. They thus rebounded from the record lows they reached in 2017. By historical comparison, however, they remain below average. This is encouraging domestic institutional investors to allocate part of their portfolios to more profitable risky assets (shares and corporate bonds; see section 3.3). Negative real yields on deposit products are also motivating households to continue investing in higher-yield financial products – especially investment fund units (see Chart II.9 CB) – and to buy property on credit (see section 2.2, Chart II.17 CB and section 5.3.1).

Chart II.9

One-year Czech government bond yield

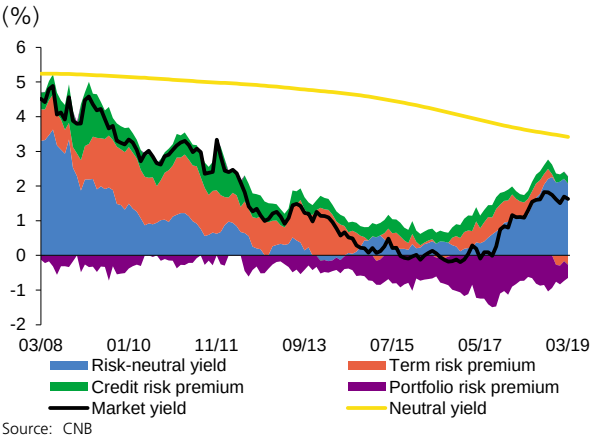


Source: CNB

Note: The decomposition of the yield curve and estimation of its neutral level is the subject of Kučera, A., Dvořák, M., Komárková, Z. (2017): *Decomposition of the Czech Government Bond Yield Curve*, thematic article, Financial Stability Report, and Kučera, A., Szabo, M. (2019): *Estimating the Neutral Czech Government Bond Yield Curve*, Thematic Article on Financial Stability 3/2019, CNB.

Chart II.10

Five-year Czech government bond yield



Source: CNB

Note: The decomposition of the yield curve and estimation of its neutral level is the subject of Kučera, A., Dvořák, M., Komárková, Z. (2017): *Decomposition of the Czech Government Bond Yield Curve*, thematic article, Financial Stability Report, and Kučera, A., Szabo, M. (2019): *Estimating the Neutral Czech Government Bond Yield Curve*, Thematic Article on Financial Stability 3/2019, CNB.

A shift in expectations about global economic developments has led yield curves to flatten

The slopes of the yield curves for koruna interest rate swaps and Czech government bonds changed in December 2018 and the first few months of 2019. As of 31 March 2019, the bond curve was flat up to a maturity of five years and the interest rate swap curve was even inverted (see Chart II.7 CB). This was due to a combination of macroeconomic and financial factors affecting long-term yields in particular. Expectations of a further increase in the monetary policy rate weakened owing to growth in uncertainty regarding the future development of the global economy and to the major central banks' communications. This illustrates the domestic financial market's high sensitivity to global macroeconomic risks and foreign financial market developments. Risk premia meanwhile decreased at the end of 2018 due to technical effects.[7] Given the persistence of these risks, including that of a sudden rise in risk premia, increased volatility can still be expected on domestic financial markets.

6 A detailed description of the method for constructing the neutral yield curve and the analytical use of the method can be found in the thematic article by Kučera, A., Szabo, M. (2019): *Estimating the Neutral Czech Government Bond Yield Curve*, Thematic Article on Financial Stability 3/2019, CNB. Together with the estimate of the neutral yield curve, the CNB also revised the method for decomposing the yield curve. This resulted in growth in volatility of the term risk premium in the decomposition compared with previous years. However, the underlying trends in the components and their economic rationale are unchanged. In its analytical use of the methods for decomposing the yield curve and estimating its neutral levels, the CNB continues to monitor the dynamics of its estimated levels rather than the absolute values.

7 Domestic banks reduced the interest paid on financial institutions' deposits to optimise their balance sheets for the calculation of contributions to the Resolution Fund. This increased the demand of depositors (insurance companies and funds) for government bonds, whose yields fell as a result. In the case of interest rate swaps, the decline was also due to speculative trades.

Domestic corporate bonds remain relatively expensive due to low risk premia

Corporate bonds also recorded low risk premia and hence relatively high prices in 2018. The average interest rate spread[8] for corporate bonds issued by domestic companies and held by domestic financial institutions remained below the long-term average (see Chart II.8 CB). Holdings of corporate bonds by domestic financial institutions thus continued to contribute to the structural element of systemic risk, as corporate bonds may represent a link in the transmission of contagion between non-financial corporations and the financial sector. The importance of this risk increased in previous years as the amount of corporate bonds held by domestic financial institutions grew (see section 3.3). This growth halted in 2016 and the contribution of potential repricing of corporate bonds to systemic risk thus stopped rising.

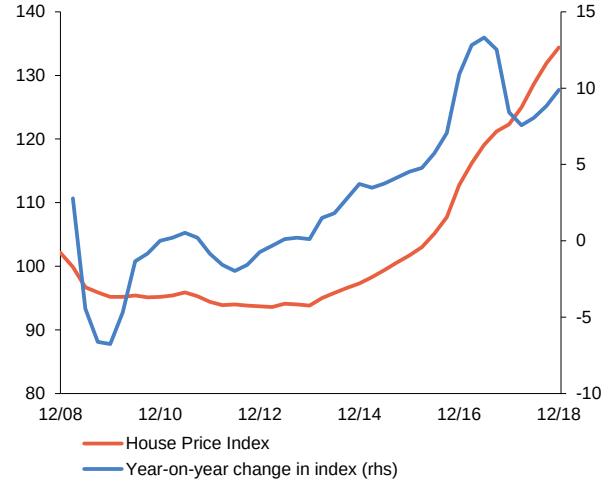
Growth in residential property prices remained high in 2018, accelerating to 10% again in 2018 H2

Transaction prices of residential property returned to rapid growth in Q4 (9.9%; see Chart II.11) following a temporary weakening of their growth in mid-2018. The current property price level exceeds the last cyclical peak in 2008 by more than 30%. The robust growth in transaction prices has long been driven mainly by high growth in apartment prices, although growth in house and land prices also accelerated (see Chart II.9 CB). Apartment prices recorded similar trends to the aggregate price index across the Czech Republic, though with slightly higher growth rates (see Chart II.10 CB). The highest growth was observed for new apartments in Prague. By contrast, growth in asking prices tended to weaken moderately in 2018 H2 (see Chart II.11 CB). This trend, along with the signs[9] coming in during the initial months of 2019, may be signalling a gradual cooling of price growth and a calming of the tight property market situation.

Chart II.11

Transaction prices of residential property

(2015 = 100; right-hand scale: %)

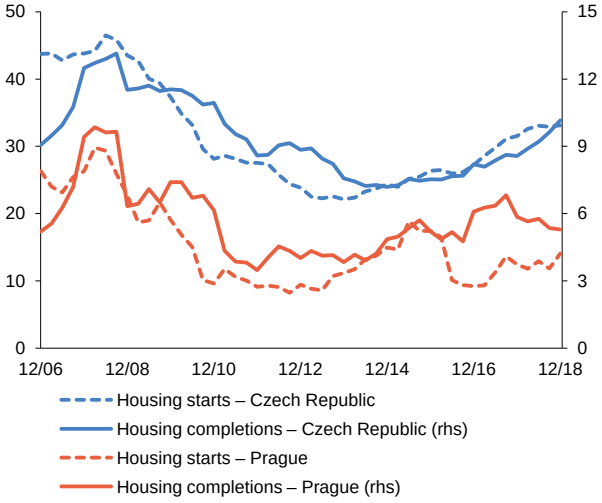


Source: CZSO

Chart II.12

Number of housing completions and housing starts

(thousands)



Source: CZSO

8 The interest rate spread is calculated as the difference between the market yield on corporate bonds and the rate for an interest rate swap of identical currency and maturity.

9 These signs include a decline in growth in asking prices and a halt in growth in transaction prices in some regions and for selected types of property. Households' borrowing capacity, indicating the maximum loan that households can safely repay, has also stopped rising.

Undersupply of apartments in cities remains a major factor of the rapid growth in property prices

Prices in cities – particularly Prague and Brno – continue to be affected by supply-side constraints, reflecting insufficient construction of new apartments due to the lengthy building permit process. The number of apartment starts and completions is currently about one-half of that in 2008, with construction responding only very slowly to the increased demand for housing in recent years (see Chart II.12). The number of apartment completions in Prague fell slightly further in 2018 and is markedly disproportionate to the amount of transactions there. While sales of apartments in Prague have long accounted for about 65%,of total apartment sales in the Czech Republic, the ratio of completed Prague apartments to the total number of apartments completed was less than 15% at the end of 2018 (see Chart II.12 CB).

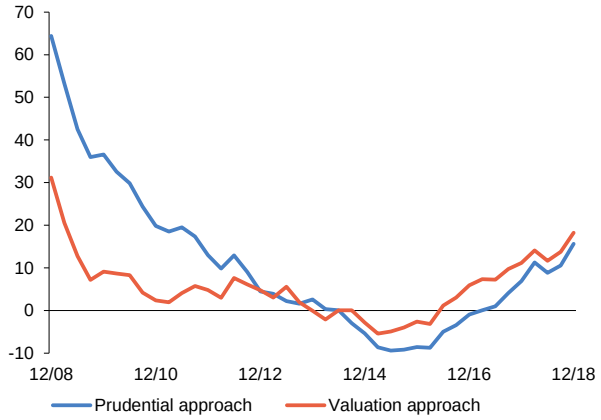
Apartment price overvaluation has increased and the affordability of housing has deteriorated

The rapid growth in apartment prices was reflected in the affordability of housing. Both price overvaluation metrics used by the CNB[10] are indicating an increasing mismatch between transaction and fundamental prices of apartments in 2018 H2 (see Chart II.13). The currently observed apartment prices thus may not be sustainable in the long run (see section 5.3.1). Despite its favourable trend, household income growth lagged behind apartment price growth without this difference being offset by a drop in interest rates on loans for house purchase (see Chart II.7). On the contrary, those rates went up slightly during the year, pushing attainable housing prices to lower levels. Other housing affordability indicators paint a similar picture. The price-to-income (PTI) and loan service-to-income (LSTI) ratios have been steadily rising over the last two years (see Chart II.14).

Chart II.13

Estimated overvaluation of apartment prices

(%)



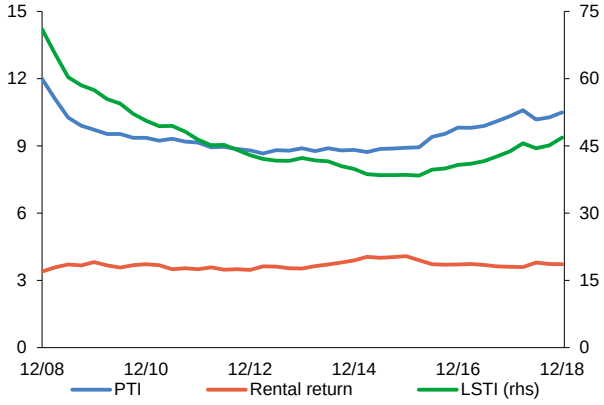
Source: CNB

Note: The methodology of the indicators is described in detail in Plašil, M., Andrle, M. (2019): *Assessing House Price Sustainability*, Thematic Article on Financial Stability 1/2019, CNB.

Chart II.14

Selected apartment affordability indicators

(PTI in years; yields in %; right-hand scale: %)



Source: CNB, CZSO, IRI, Společnost pro cenové mapy ČR, s.r.o.

Note: PTI is the price-to-income ratio and LSTI the loan-to-income ratio. The apartment price is defined as the average price of a 68 m^2 apartment. Income is defined as the annual moving total of the gross monthly wage. A loan with an LTV of 80% and a repayment period of 25 years was considered for the LSTI calculation.

10 The prudential approach and the valuation approach are described in detail in the thematic article Plašil, M., Andrle, M. (2019): *Assessing House Price Sustainability*, Thematic Article on Financial Stability 1/2019, CNB.

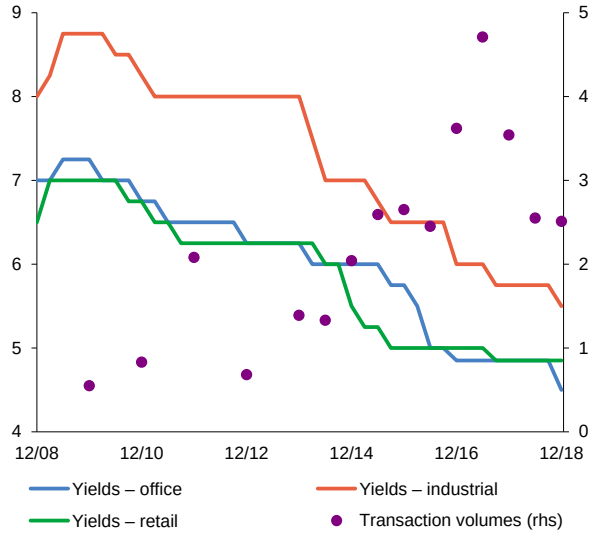
Yields on the monitored types of commercial property remained at historical lows or declined further

Prime commercial property prices stayed high in 2018. Yields demanded by investors remained at historical lows or – in the case of office and industrial property – even declined further in Q4 (see Chart II.15). By the CNB's estimation, prices of these types of commercial property also remain the most overvalued (see Chart II.16). Rapid growth in overvaluation can be observed especially for office property. On the supply side, the strongest market response to the price growth was in the construction of new industrial property (see Chart II.13 CB). However, the total transaction activity on the commercial property market returned to the levels observed in previous years following sharp upswing in 2017 (see Chart II.15; for additional information see section 5.3.2).

Chart II.15

Yields on commercial property and transaction volumes

(%; right-hand scale: EUR billions)

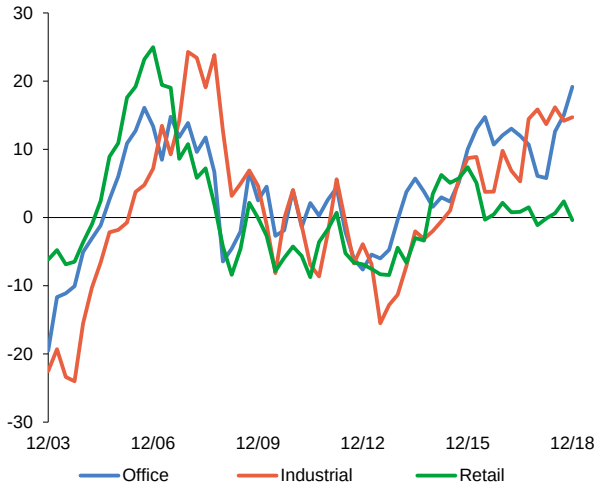


Source: Jones Lang LaSalle
Note: Prime yields. Transaction volumes are reported at annual frequency until 2013 and as annual moving totals at semi-annual frequency from 2014 onwards.

Chart II.16

Estimated overvaluation of commercial property prices

(%)



Source: Jones Lang LaSalle, CNB
Note: Overvaluation as estimated by panel regression on a sample of Central and Eastern European countries (CZ, SK, PL, HU and RO) and Germany. Final overvaluation estimate determined as the four-period average.

2.1.3 Alternative Economic Scenarios[11]

In the *Baseline Scenario* the growth in domestic economic activity continues…

The *Baseline Scenario* assumes economic growth of 2.9% on average over the four quarters of this year. In the following two years, GDP growth will remain at 3% on average. Increasing investment and continued economic growth are accompanied by rising wages, and the general unemployment rate remains at its current low levels over the entire three-year scenario horizon. Inflation is around the 2% inflation target. Consistent with this scenario are market interest rates, whose average level is flat in the first two years and rises to 2.9% at the end of the third year.

…while in the *Adverse Scenario* the economy gets into a V-shaped recession

The *Adverse Scenario* assumes a marked drop in economic activity around the world due to the materialisation of global risks. The export-oriented domestic economy falls into a recession owing to falling external demand. This causes pessimistic expectations about future economic developments, a downturn in household consumption and deferral of corporate investment. The combination of a downturn in external demand and then also in domestic demand causes a sizeable and long-lasting decline in domestic economic activity and results in a V-shaped recession. The recession – lasting nine quarters – leads to a drop in annual real GDP growth from 2.3% in 2018 Q4 to -5.8% in 2020. In this adverse economic situation, the funds of households and non-financial corporations are gradually exhausted. Coupled with a rise in real debt, this causes their debt servicing ability to worsen significantly. Property prices record a sharp correction and their year-on-year growth turns significantly negative and stays there until the end of the three-year test horizon. The problems in the real economy also affect the financial sector, which records considerable credit losses and a marked drop in profits. The growth rate of loans falls sharply (see Chart II.23). Monetary policy eases, the three-month PRIBOR rate decreases to low levels, where it stays over the entire test horizon, and the exchange rate weakens sharply. However, long-term bond yields increase as global risk aversion increases and the quality of some assets is re-assessed. At the same time, banks tighten their view of credit risk and increase their risk mark-ups on interest rates on new loans, which rise to a much higher level also due to an increase in long-term interest rates. The rise in debt service together with the other impacts of the recession increase the default rate on loans to both households and non-financial corporations (see Chart II.27).

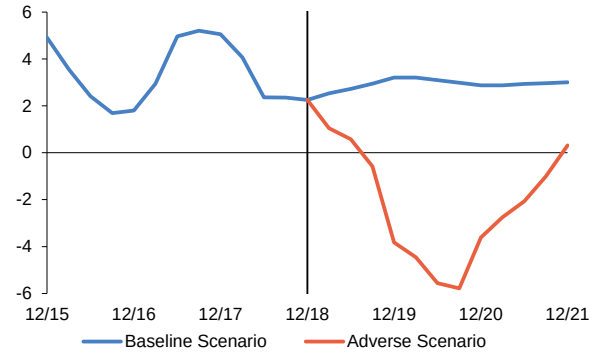
Charts II.17A–F show the evolution of the main macroeconomic indicators of the *Baseline Scenario* and the *Adverse Scenario*. The stress scenario represents very tough but still plausible adverse developments.

11 The *Baseline Scenario* was created for stress testing purposes and is based on the CNB's official forecast published in Inflation Report I/2019, which was approved by the CNB Bank Board on 14 February 2019.The *Baseline Scenario* for the third year and the *Adverse Scenario* were created solely for the purposes of stress testing the financial sector. Therefore, neither the *Baseline Scenario* beyond the horizon of the forecast published in Inflation Report I/2019, nor the *Adverse Scenario* is an official forecast of the CNB.

Chart II.17A

Alternative scenarios: real GDP growth

(year on year in %)

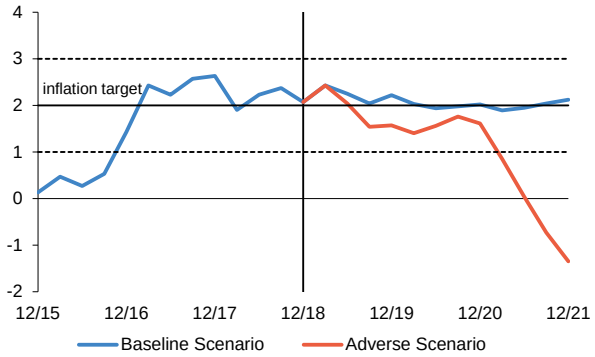


Source: CNB

Chart II.17B

Alternative scenarios: inflation

(year on year in %)

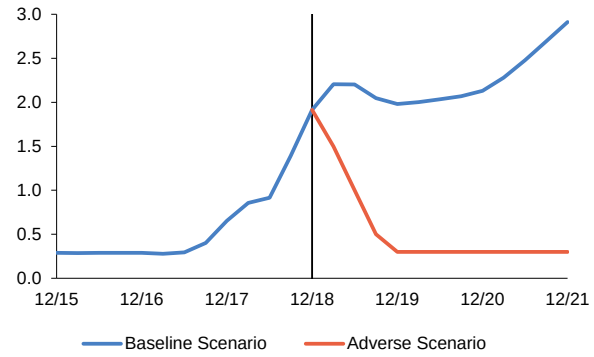


Source: CNB

Chart II.17C

Alternative scenarios: 3M PRIBOR

(%)

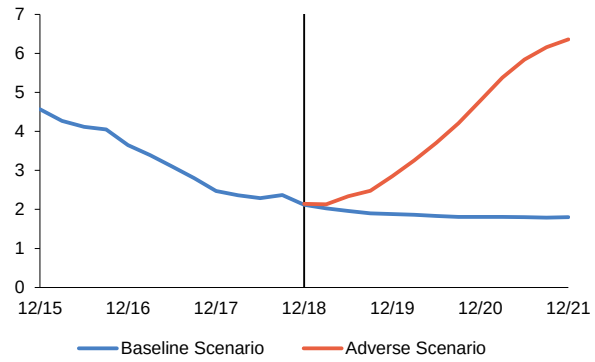


Source: CNB

Chart II.17D

Alternative scenarios: unemployment

(%)

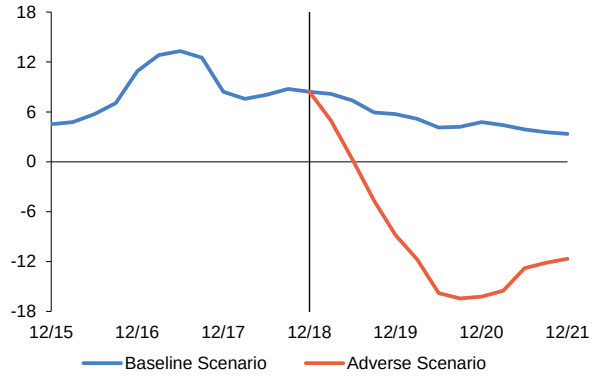


Source: CNB

Chart II.17E

Alternative scenarios: year-on-year property price growth

(%)

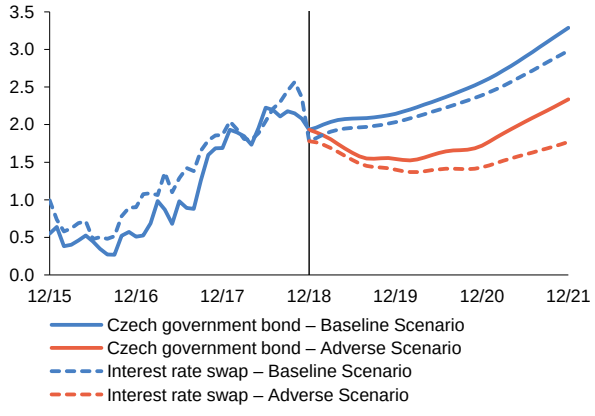


Source: CNB

Chart II.17F

Alternative scenarios: ten-year yields

(%)



Source: CNB

2.2 THE PRIVATE NON-FINANCIAL SECTOR

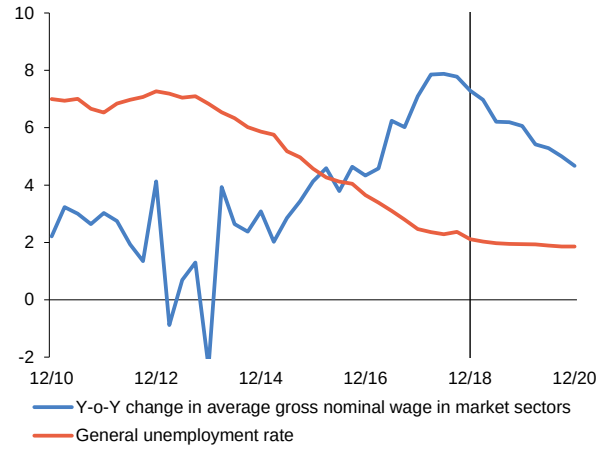
The labour market developed very favourably from the perspective of households, encouraging consumer optimism…

Unemployment continued to decline gradually in 2018. Wage growth remained robust, reaching its cyclical peak in 2018 Q2. The strong wage growth had a positive effect on households' purchasing power and was reflected in persisting optimistic expectations and consumer behaviour (see Chart II.14 CB). The CNB's macroeconomic forecast published in Inflation Report II/2019 expects wage growth to slow gradually to just below 5% in the second half of 2020 and does not expect any further major decline in unemployment (see Chart II.18).

Chart II.18

Labour market indicators

(%)

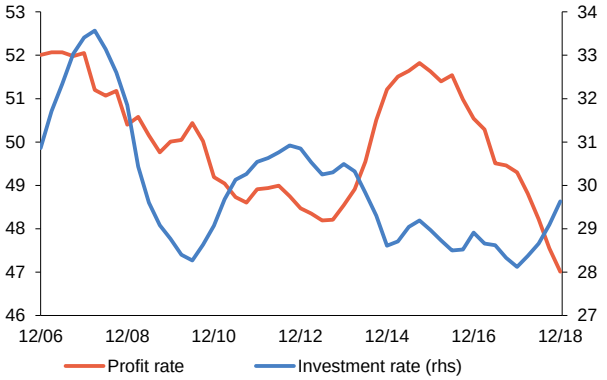


Source: CNB, CZSO
Note: The general unemployment rate is seasonally adjusted. The vertical line divides the observed values and the official macroeconomic forecast in Inflation Report II/2019.

Chart II.19

Profit rate and investment rate in the non-financial corporations sector

(% of gross value added; calculated from annual moving totals)



Source: CZSO
Note: The profit rate is the ratio of gross operating surplus to the gross value added of the sector. The investment rate is the ratio of gross fixed capital formation to the gross value added of the sector.

…but for non-financial corporations meant a decline in profitability…

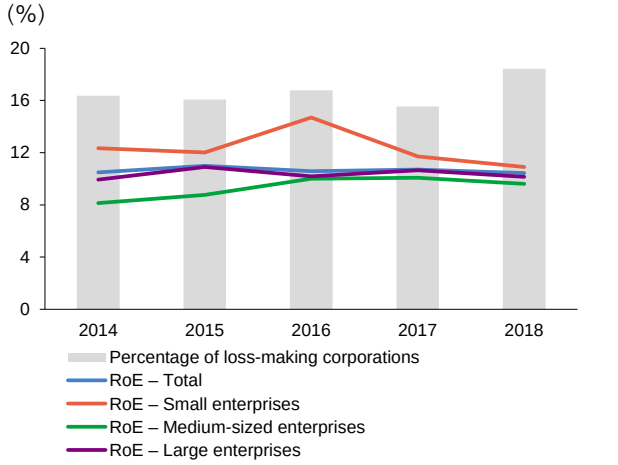
The wage growth combined with growth in employment led to a year-on-year increase in compensation of employees of 9% at the end of 2018. This caused the sector's gross operating surplus to decline and its profitability to decrease further (see Chart II.19) across all firm sizes. The proportion of loss-making firms also increased considerably (see Chart II.20), especially in property development, manufacturing and energy generation and distribution. However, the average return on equity in manufacturing as a whole (particularly the automotive industry) remained well above that in other sub-sectors (see Chart II.21). If the *Baseline Scenario* were to materialise, most sub-sectors would maintain or slightly increase their current profitability in the years ahead (see the new stress test of the non-financial corporations sector in Box 2.2). Profitability in manufacturing, however, would drop. The sector's profit rate would be flat in 2019 and rise slowly in the following years due to weakening wage growth.

…and a shift to higher investment in an effort to substitute labour with capital

The shortage of labour and fast growing labour costs also affected corporate investment. Gross fixed capital formation in non-financial corporations rose at its fastest rate since 2008, the total volume being 9.7% higher year on year in 2018. However, investment bank loans tended to decline year on year (see Chart V.5), indicating that non-financial corporations financed investment partly using profits generated in the past or funds obtained outside the banking sector. Comparing the profit rate and the investment rate at the pan-European level, non-financial corporations in the Czech Republic have above-average levels (see Chart II.15 CB and Chart II.16 CB).

Chart II.20

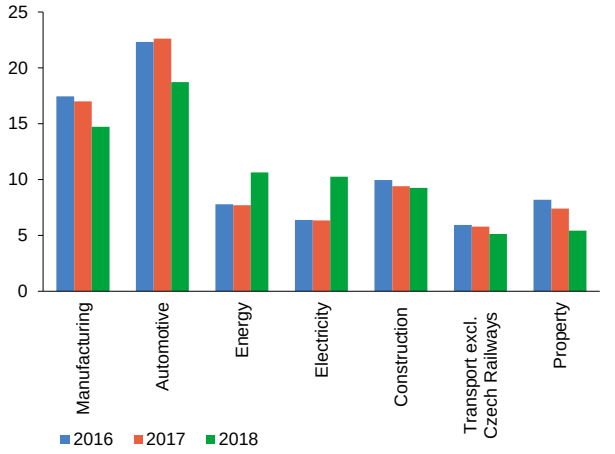
After-tax RoE by enterprise size and percentage of loss-making non-financial corporations



Source: CZSO
Note: The results are based on a sample of non-financial corporations. The sample contains around 1,500 corporations accounting together for more than 40% of the sector's gross value added.

Chart II.21

After-tax RoE in selected sub-sectors



Source: CZSO
Note: Energy comprises electricity, gas, heat and air-conditioned air. The results are based on a sample of non-financial corporations. The property development sector is included under construction.

BOX 2.2: STRESS TESTING IN THE NON-FINANCIAL CORPORATIONS SECTOR

The non-financial corporations sector is the most important sector of the national economy in terms of size. It accounts for around 62% of gross value added formation in the whole economy. It is therefore regularly subjected to detailed analyses. However, no analytical tool taking into account the heterogeneity of the sector and modelling the importance of inter- and intra-sector links for the spread of negative shocks across sub-sectors has yet been fully developed for the domestic economy. Analysing these links is of crucial importance because the transmission of shocks between sub-sectors can exacerbate a decline in the output of the sector as a whole, worsen its profitability and subsequently spill over to other sectors (in the form, for example, of a reduction in demand for labour or a deterioration in debt servicing ability).

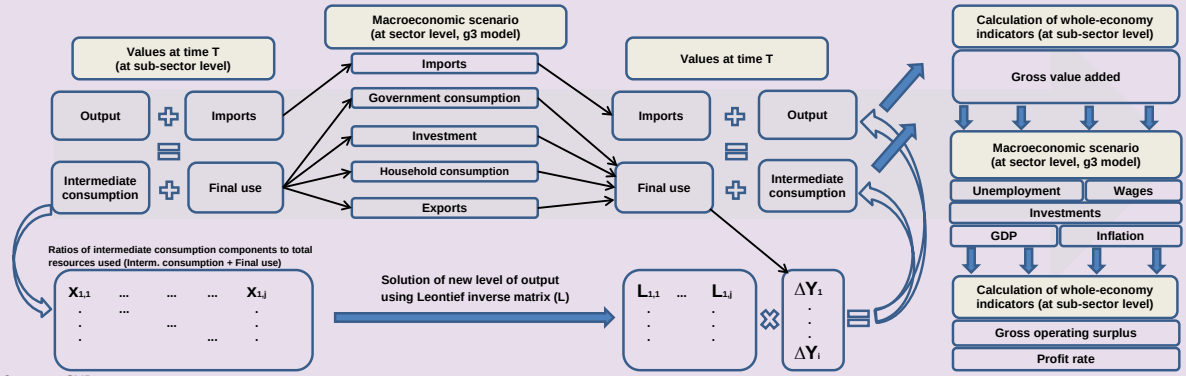
Stress-testing exercises are carried out by many central banks. The most frequently used approaches include sensitivity analysis of individual risk indicators (such as interest coverage or profitability) and aggregate risk characteristics (such as the Altman Z score[12]) and non-linear credit risk estimates for large corporations (the Merton model[13]). The advantages of these methods are that they are simple to construct, their results are easy to interpret and they have low data-intensity. Nevertheless, these approaches do not enable us to capture the above spread of economic shocks across sub-sectors and the potential reactions of sub-sectors to a drop in demand in other sub-sectors (the indirect effects of shocks).

12 Altman, E. (1968): *Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy*, Journal of Finance, 23(4), pp. 189–209.
13 Merton, R. (1974): *On the Pricing of Corporate Debt: The Risk Structure of Interest Rates*, Journal of Finance, 29(2), pp. 449–470.

The CNB therefore started to develop a more realistic model for stress testing the non-financial corporations sector, one that captures the production linkages between sub-sectors. The model is based on the system of national accounts, which defines the main economic identities, and on input-output tables providing a detailed description of the linkages between sub-sectors. The model construction process involves two phases. In the first phase, the relationships in the production chain across sub-sectors are defined and the effect of the macroeconomic scenario on their profitability and risk characteristics is estimated. The first step of this phase is based on the economic identity[14] that the sum of the total production and imports of each sub-sector equals the sum of intermediate consumption[15] and end-use.[16] Demand for end-use is based on the macroeconomic scenario. With knowledge of the end-use (a direct effect), the size of the indirect effects resulting from changes in intermediate consumption can be quantified and the resulting changes in total production can thus be modelled (see Figure II.1 Box). In the second step of this phase, the evolution of input costs is estimated on the basis of the underlying macroeconomic scenario, and gross value added and gross operating surplus are derived for each sub-sector.

Figure II.1 Box

Stress testing in the non-financial corporations sector: macroeconomic simulation (Phase 1)



Source: CNB

The first phase of the model was applied to the *Baseline Scenario* using the latest known (end-2017) input-output table. Chart II.5 Box and Chart II.6 Box show the future evolution of the whole-economy profitability ratios in the form of the gross operating surplus or the profit rate in the largest sub-sectors. Heterogeneity is observed in the growth rates of the gross operating surplus across sub-sectors in the first two years. This disappears in subsequent periods, owing to the assumption that each end-use component has the same effect on all sub-sectors and the overall impact is not differentiated for different sub-sectors. However, this assumption can be adjusted depending on the specific scenario simulated, enabling selected cyclical sub-sectors to be subjected to higher stress. In the case of the profit rate, the effect of above-average wage growth is reflected in the developments in the initial years.

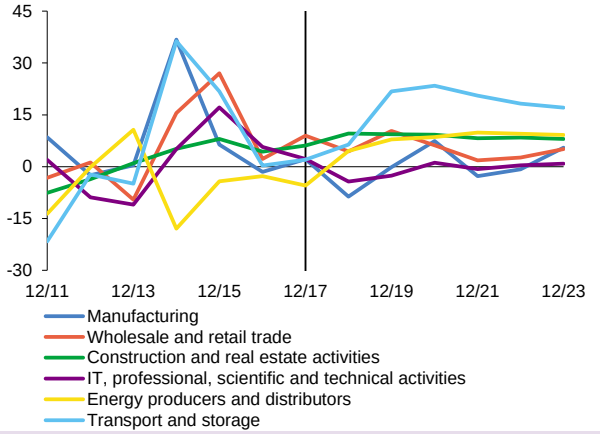
The estimated whole-economy indicators represent the main input information for the second phase of the stress test, where the macroeconomic impacts are reflected in the performance of individual corporations and their default risk is assessed. In this phase, it is necessary to link the performance of the sub-sector with the balance sheets and profit and loss accounts of individual firms. This part of the stress test is currently being developed.

14 This description abstracts from taxes, subsidies, margins on goods and transport mark-ups, which transform production from basic prices to purchase prices. These items are taken into account in the model.
15 Intermediate consumption is the value of the goods and services consumed during the period in question by resident producers in the process of production of goods and services.
16 End-use consists of the consumption expenditure of households, non-profit institutions serving households and the government sector, gross fixed capital formation, changes in inventories and exports.

Chart II.5 Box

Growth rate of gross operating surplus in the largest sub-sectors

(year-on-year growth rate in %)



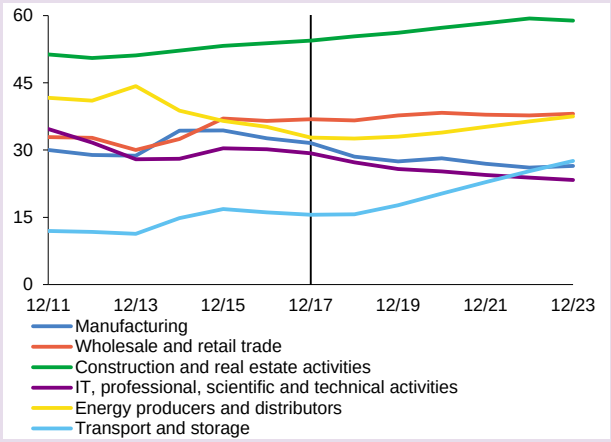
Source: CZSO, CNB

Note: The vertical line divides the observed values and the forecasted values. The forecast for each sub-sector is based on the macroeconomic forecast published in Inflation Report I/2019. The forecast threshold corresponds to 2017 in line with the latest known input-output table.

Chart II.6 Box

Profit rate in the largest sub-sectors

(%)



Source: CZSO, CNB

Note: The profit rate is the ratio of gross operating surplus to the gross value added of the sector. The vertical line divides the observed values and the forecasted values. The forecast for each sub-sector is based on the macroeconomic forecast published in Inflation Report I/2019. The forecast threshold corresponds to 2017 in line with the latest known input-output table.

External demand developments remain the primary risk to the non-financial corporations sector…

Given that the domestic economy is strongly export-oriented, the largest risk to the non-financial corporations sector is a fall in external demand. This risk increased last year due to a heightened level of uncertainty regarding the increase in protectionism in international trade, the still incomplete Brexit negotiations (Inflation Report I/2019, section II.4 and Box) and the slowdown of the global economy. This uncertainty has been incorporated to a large extent into the *Adverse Scenario* (see section 2.1). Persisting strong growth in wage costs could also pose a risk to the financial health of the non-financial corporations sector, exerting downward pressure on their profitability or reducing their competitiveness on the international scale.

…while continued over-optimism in an environment of favourable financial conditions and high wage growth is the main risk to the household sector

A sustained combination of low interest rates and buoyant wage growth can cause households to succumb to the illusion of being able to service loans without any problem. As a result, they increase their debt levels and their consumption, which they are increasingly willing to finance on debt (see Chart V.3 and Chart II.14 CB). The accumulated risks then materialise when client interest rates suddenly increase, wage growth drops[17] and unemployment rises. In these circumstances, a proportion of households with high levels of debt could get into financial difficulties and stop repaying their debts (see section 4.3). Another possible manifestation of a long period of low interest rates is a decrease in the saving rate (see Box 2.3). In the case of the Czech economy this is not confirmed for the time being, because the saving rate, after falling somewhat, started to rise again during 2018 according to the latest available data (see Chart II.8 Box). If household savings are invested in assets sensitive to developments on financial markets (see Chart II.17 CB), a sudden repricing of such assets can trigger a fall in their consumption and investment and indirectly also an economic slowdown and a deterioration in loan portfolio quality.

17 The fixed component of wages (base wages) is characterised by strong downward rigidity. Nonetheless, a significant portion of wage growth consists of a rise in the flexible component of wages (benefits and bonuses), which can be highly sensitive to changes in the business cycle. This portion can decrease considerably, causing overall wage growth even to turn negative.

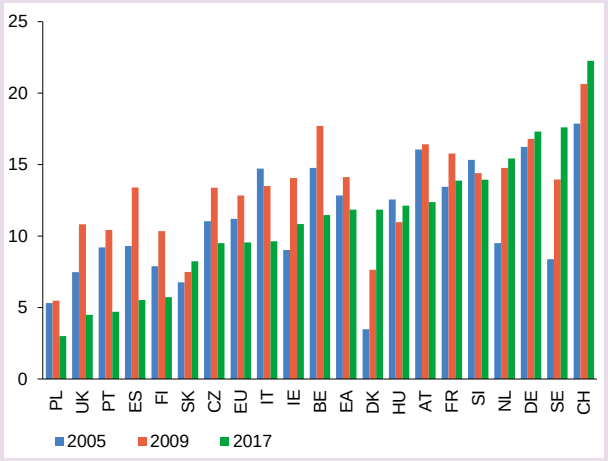
BOX 2.3: HOUSEHOLDS' SAVING AND INVESTMENT BEHAVIOUR OVER THE CYCLE

Household saving and investment rates are useful indicators of the economy's position in the business and financial cycle. Czech households' gross rate of saving from disposable income[18] (the portion of their disposable income that is not used for consumption) is not low in the long term by comparison with other European countries and is also quite stable (see Chart II.7 Box and Chart II.8 Box).[19] Data from the last two decades also indicate that Czech households tend to behave procyclically and do not smooth consumption by changing their saving rates. In other words, they do not save more in good times in order to maintain their consumption level in bad times. This is because the precautionary motive plays a big role in households' behaviour. Once a recession or heightened economic uncertainty arrives, they prefer to rein in their consumption and attempt to save more in order to create reserves. With the onset of the global financial crisis in 2009, households in most EU countries reacted similarly (see Chart II.7 Box). The similarity of the reaction is probably due to the extraordinary intensity of the shock to which economies were exposed at the time. As the crisis faded, the saving rate in most countries decreased again, although large differences arose between countries. These are nothing unusual, as the saving rate generally differs across countries due to institutional, demographic and socio-economic differences.

Chart II.7 Box

Gross saving rates of households in EU countries

(% of gross disposable income)

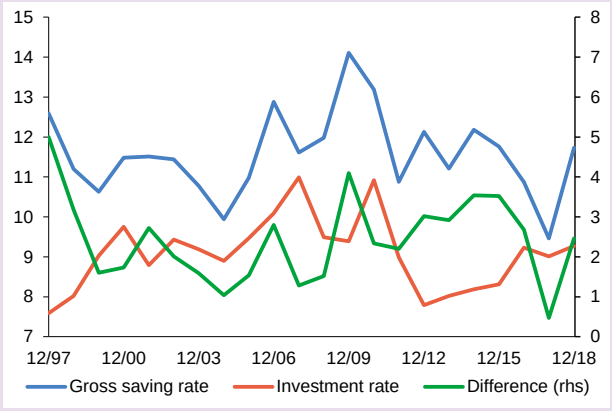


Source: Eurostat

Chart II.8 Box

Gross saving and investment rates of households in the Czech Republic

(% of gross disposable income; right-hand scale: pp)



Source: CZSO

18 In the national accounts, "saving" means the difference between income and consumption expenditure in a given period (a flow variable). It differs from the term savings as commonly used to mean the accumulated stock of financial assets (a stock variable), which is referred to as financial wealth in the national accounts. This box discusses saving measured in terms of flows.

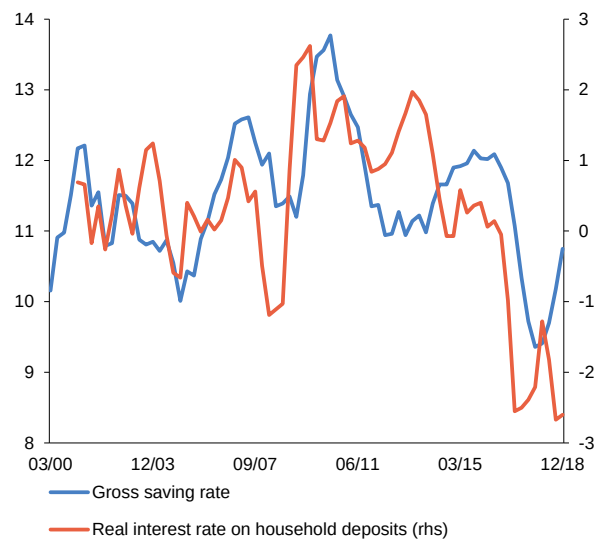
19 Gross saving and investment rates should be interpreted with considerable caution, as the saving rate is obtained indirectly and can therefore be subject to significant revisions. The cross-country comparability of the two indicators may be limited by, for example, differences in methodology or in pension systems.

According to prevailing theoretical approaches, the decrease in households' saving rates in many European countries in recent years can be explained by the low nominal and real interest rates on the products in which the savings are invested. These approaches assume that changes in (real) interest rates affect households' decisions via a substitution effect due to positive a time preference. A decrease in interest rates leads to an intertemporal substitution effect where households prefer current to future consumption (i.e. they increase their current consumption and reduce their current saving rate). Such behaviour is due to falling opportunity costs in the form of interest foregone. If the interest compensating for deferring consumption to the future is too low, consumers will prefer to increase their current consumption and reduce their saving. In the Czech Republic, there is quite a strong correlation between the gross saving rate and the real interest rate, testifying to the existence of a substitution effect (see Chart II.9 Box).

Chart II.9 Box

Gross saving rate of households and real interest rate

(% of gross disposable income; right-hand scale: %)

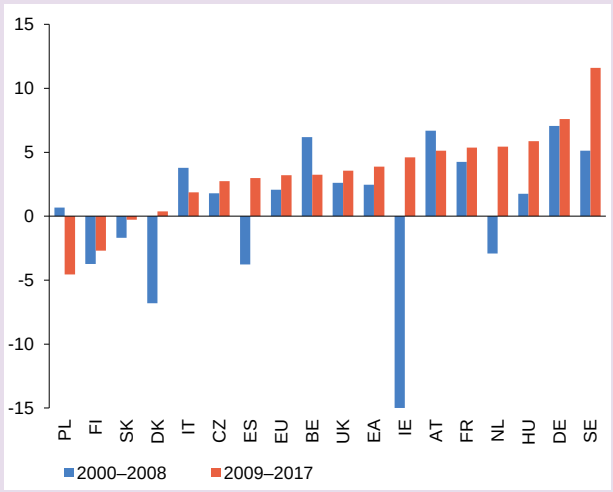


Source: CZSO, CNB
Note: The real interest rate is calculated as the difference between the average deposit interest rate and core inflation.

Chart II.10 Box

Difference between households' gross saving and investment rates in the pre-crisis and post-crisis decades

(pp)



Source: Eurostat
Note: Saving and investment rates are calculated as a percentage of gross disposable income.

However, the results of empirical studies on the relationship between the saving rate and interest rates do not show an unambiguous relationship in any country. This is because the reaction of the saving rate to a change in interest rates is also influenced by an income effect. It describes the situation where a decrease in interest rates leads to an increase in the saving rate. Households expect a lower future stream of income on their assets and attempt to save more in order to make up their intended future level of asset income. In other words, individuals try to reach a certain level of savings at lower interest rates in order to maintain their desired future standard of living. The resulting overall impact of changes in interest rates (the interest elasticity of the saving rate) thus depends on whether the substitution effect or the income effect prevails.

The majority of empirical studies tend to conclude that the substitution effect is dominant, especially for developed economies.[20] It can be assumed that the same is true for the ''cultural environment'' in which the Czech Republic is now. Some studies also suggest that the income effect may be strong or even dominant in countries with demographically uneven population distributions, minimal social systems, highly unstable economic activity or untrustworthy pension systems.

The decrease in saving rates in many countries in recent years can be considered risky from the long-term perspective. Household savings are one of the main sources of financial investment in the real economy, which is a key factor of economic growth. Besides their wealth, households generally use a substantial portion of their savings to buy and maintain owner-occupied housing. In particular, if house prices rise faster than households' income, the investment rate in the household sector may exceed the saving rate for a time. In such a case, households draw on the savings they have accumulated in the past, the savings of other sectors, or foreign sources. This has not yet happened in the case of Czech households (see Chart II.8 Box), although in 2017[21] the difference between the two indicators was almost zero. The situation is similar in most EU countries (see Chart II.10 Box). It is worth mentioning that some countries (DK, ES, IE, NL) recorded negative differences in the pre-crisis decade, differences which were completely eliminated in the post-crisis years. It is no coincidence that these countries recorded significant increases in household indebtedness in the pre-crisis years against a backdrop of strong growth in house prices. In cases where households invest largely in ''overpriced'' properties, inefficient utilisation of savings may occur. This, in turn, is usually reflected in sharp macroeconomic volatility and structural distortions in the economies concerned. Correctly conducted macroprudential policy helps to prevent such episodes from becoming excessive.

Borrowing by non-financial corporations picked up pace in 2018 and their ratio of debt to gross operating surplus rose…

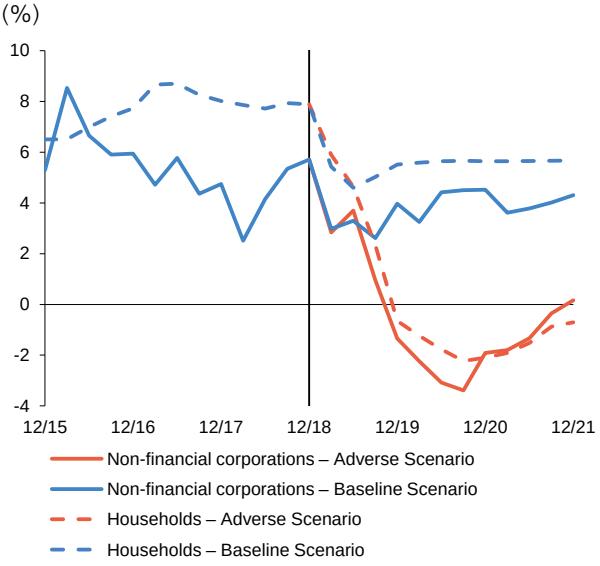
Year-on-year growth in bank loans to non-financial corporations reached 6.2% in March 2019 (see Chart V.3) and remained above-average in the context of the last ten years (see Chart V.4). Financing by non-bank financial corporations engaged in lending rose at the same rate, while the volume of bonds issued recorded somewhat weaker growth (4.4% year on year in 2018 Q4). Despite a temporary decrease, the rate of growth of foreign currency bank loans to non-financial corporations remains higher in the long run than that of total loans. Accordingly, the share of foreign currency loans rose by 2.3 pp to 31.6% of bank loans provided to this sector (see Chart II.22). In accordance with the observed credit dynamics, the ratio of non-financial corporations' total debt[22] to gross operating surplus increased to 218%. However, it remains the second lowest in the OECD. The *Baseline Scenario* assumes that growth in the stock of loans will slow slightly to around 4% (see Chart II.23). If the *Adverse Scenario* materialises, the economy will experience a strong credit contraction and the growth rate of loans to non-financial corporations will quickly turn negative. Year-on-year growth in new koruna bank loans in the non-financial corporations sector was highly volatile during the year (see Chart II.24). Nonetheless, the total volume of new koruna loans as of March 2019 had increased over the past 12 months by a solid 8.1% compared with the preceding 12 months.

20 Aizenman, J., Cheung, Yin-Wong and Hiro Ito (2016*): The Interest Rate Effect on Private Saving: Alternative Perspectives*, NBER Working Paper, No. 22872. Lehrer, E., and Bar Light (2018): *The Effect of Interest Rates on Consumption in an Income Fluctuation Problem*, Journal of Economic Dynamics and Control, 94, pp. 63–71.
21 The latest available data are for 2017.
22 Total debt here encompasses bank loans, bonds, loans from non-bank lenders and intra-company loans.

Chart II.22
Selected characteristics of foreign currency loans in the non-financial corporations sector

Source: CNB
Note: Foreign currency loans are smoothed by the 3-month moving average.

Chart II.23
Year-on-year growth in bank loans to households and non-financial corporations



Source: CNB

…the volume of loans drawn by the household sector remained elevated

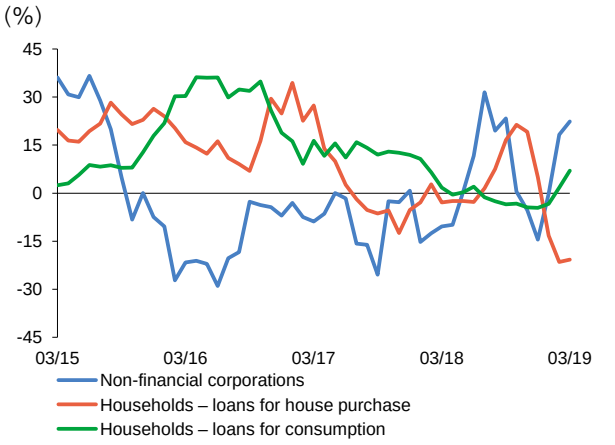
In March 2019, the rate of growth of loans for house purchase decreased by 0.7 pp year on year to 8.0%, whereas that of loans to households for consumption increased by 1.6 pp year on year to 6.2% (see Chart V.3). Despite having slowed slightly, the growth in the stock of loans for house purchase remains high and is contributing to high growth in prices of residential property (see sections 2.1 and 5.3.1). In addition to optimistic expectations (see Chart II.14 CB), the credit activity of households was supported by persisting low loans rates, which have so far only partly reflected the monetary policy tightening in 2018 (see Chart II.7 and section 2.1). Taking into account wage growth, the perceived real costs of loans for house purchase remain highly negative. Growth in new bank loans provided to households for house purchase showed a high degree of volatility (see section 5.3.1). The total volume of loans granted in the past 12 months compared with the preceding 12 months did not rise further in March 2019, but is still above the historical average (see Chart II.24). In the *Baseline Scenario*, the rate of growth of loans to households will drop to 5.5% in 2019 and remain stable in the following years (see Chart II.23). In the *Adverse Scenario*, by contrast, the growth rate of loans will fall rapidly.

Household debt remained flat in relation to disposable income

The debt-to-income ratio of households was flat at 60.8% in 2018 (see Chart II.25). It is still relatively low in the European context and does not currently represent an immediate source of systemic risk. However, the pace of growth of disposable income observed in 2017 and 2018 is probably unsustainable in the long run. Assuming that income growth returns to lower levels and credit growth stays unchanged, the debt ratio could thus start to rise more markedly.

Chart II.24

Year-on-year growth in new koruna loans to the private non-financial sector

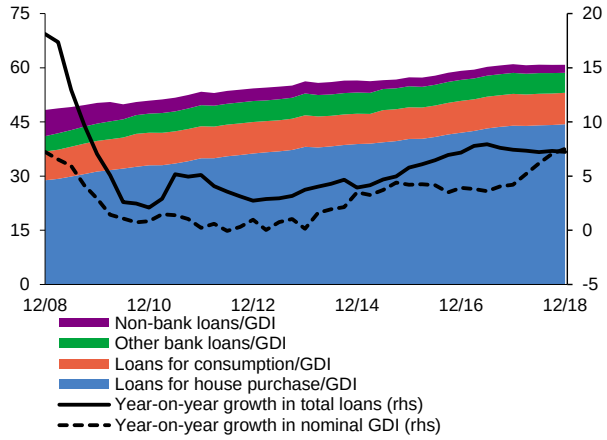


Source: CNB
Note: The household sector also includes data for NPISHs. The year-on-year growth rates are smoothed by the 3-month moving average.

Chart II.25

Household indebtedness and income indicators

(%; right-hand scale: year-on-year growth in %)



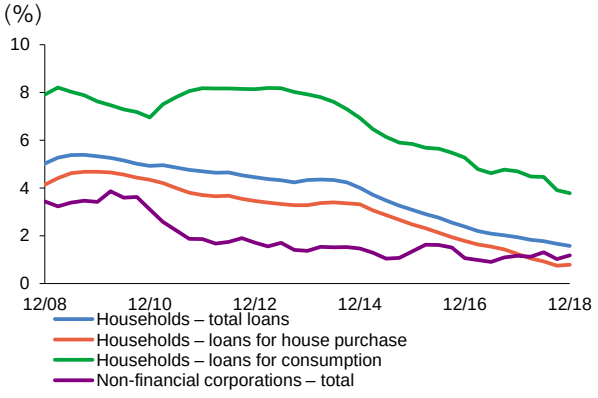
Source: CNB, CZSO
Note: Non-bank loans are loans provided by other financial institutions. GDI stands for gross disposable income. The household sector also includes data for NPISHs.

Credit risk continued to follow a downward trend

Credit risk in the non-financial corporations sector, as measured by the 12-month default rate, fluctuated between 1.0% and 1.5% and has probably reached its cyclical trough (see Chart II.26). A decrease in credit risk was seen in the household sector, due to income growth and currently low debt servicing costs. Neither sector is likely to see any significant decrease in credit risk in the next few years. The *Baseline Scenario* expects the 12-month default rate for corporations and households to decrease only very slowly. If the *Adverse Scenario* were to materialise, credit risk would increase sharply to almost 5% in the first two years. Subsequently, the default rate would remain high or start to fall slowly (see Chart II.27). The non-performing loan ratio, measuring the materialisation of risks taken on in the past, followed the same pattern as credit risk, being flat in the case of non-financial corporations and decreasing slightly in the household sector (see Chart II.19 CB). This decrease was due not only to positive economic developments, but also to strong credit growth, which contributed to an increase in the denominator of the indicator.

Chart II.26

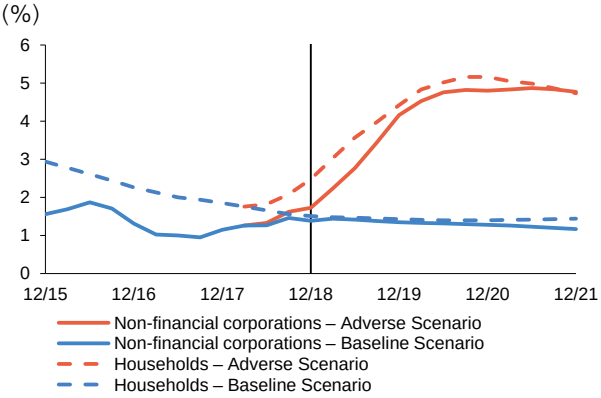
12-month default rate in the private non-financial sector



Source: CNB, CIBR

Chart II.27

12M default rate on bank loans to households and non-financial corporations



Source: CNB

3 THE FINANCIAL SECTOR

The domestic financial sector showed favourable trends in 2018 and expanded in all segments. The banking sector strengthened its capitalisation and profitability and has high liquidity. Insurance companies maintained their capitalisation and profitability in a situation where financial market developments adversely affected their assets and liabilities. Pension management companies and investment funds were hit by changes in the prices of some of their assets at the end of 2018. However, this did not lead to an exodus of investors or to systemically important losses.

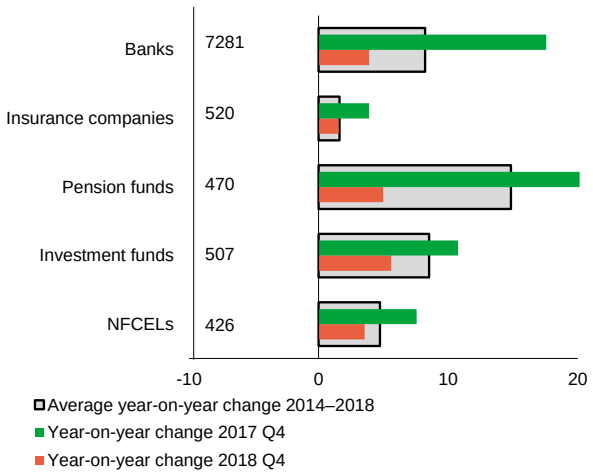
The favourable economic trends are naturally giving rise to vulnerability risks in the event of a change in the business and financial cycle. Banks' high profitability and capitalisation is to a large extent conditional on very low asset impairment losses, a continued decline in the risk weights of the credit portfolios of most of the banking sector and rising monetary policy rates amid high bank liquidity. A contraction in the cycle could lead to a sharp rise in credit losses, a significant drop in profitability and growth in risk weights, followed by a negative impact on banks' capitalisation. The greater sensitivity of the segments of pension and investment funds and insurance companies to financial market developments and changes in asset prices requires high-quality management of market and liquidity risks to maintain long-term confidence among participants, investors and clients. However, stress test results demonstrate that the current capitalisation, liquidity and profitability of the most important segments of the financial sector ensure high resilience to the shocks assumed.

3.1 DEVELOPMENTS IN THE FINANCIAL SECTOR

Chart III.1

Rates of growth of segments of the financial sector

(%)

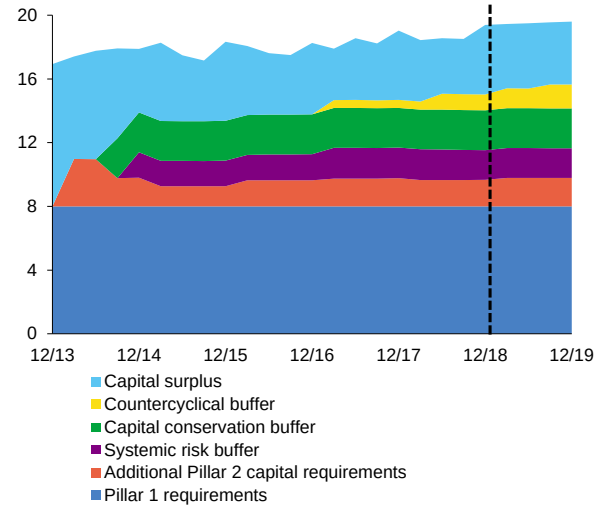


Source: CNB
Note: NFCELs = non-bank financial corporations engaged in lending. The figure next to the segment name denotes total assets as of the end of 2018 in CZK billions. The banking sector also includes credit unions.

Chart III.2

Structure of capital requirements in the domestic banking sector

(%)



Source: CNB
Note: Due to partial overlap of the capital conservation buffer requirements with the Pillar 2 requirement, the Pillar 2 requirements have since July 2014 been adjusted for the requirements arising from the stress tests conducted for supervisory purposes. The capital surplus prediction for 2019 assumes constant risk weights. Risky exposures are calculated on the basis of banks' assumptions about future loans, which banks report in the statement "Bank financing plans" (FPSIFE10).

The total assets of investment funds converged towards the level in insurance companies

All segments of the financial sector saw year-on-year growth in total assets at the end of 2018 (see Chart III.1). Total assets grew by 3.8% year on year to CZK 9.2 trillion (178.2% of GDP).[23] The banking sector,[24] which accounts for almost 80% of the financial sector's assets (see Chart III.1), recorded the largest growth in absolute terms (CZK 273 billion, or 3.9%). The highest rates of growth in total assets were recorded by pension funds (CZK 25 billion, or 5.6%) and investment funds (CZK 24 billion, or 5.0%). Investment funds' total assets converged towards the level in insurance companies.

3.2 BANKS

3.2.1 Capital

Banks' capitalisation increased in 2018

The total regulatory capital in the domestic banking sector rose by CZK 22 billion in 2018, reaching CZK 494 billion.[25] The overall capital ratio increased by 0.4 pp to 19.6% (see Chart III.2) and the Tier 1 capital ratio by 0.4 pp to 19.1%. Accumulation of capital from profit (+1.1 pp of the capital ratio) and a decline in aggregate risk weights (+0.3 pp) outweighed the effect of growth in client loans (-0.8 pp) and other assets (-0.2 pp) on the capital ratio.

Capital surpluses are an important component of capitalisation

Most banks meet the overall capital requirement, consisting of the minimum level of regulatory capital in Pillar 1 (8%), a requirement based on the supervisory review and evaluation process in Pillar 2 (an average of 1.8% for the sector) and capital buffers (an average of 5.9% for the sector), by a sufficient margin. The capital surplus of systemically important banks amounts to CZK 66 billion (3.6 pp) and that of other banks to CZK 48 billion (6.2 pp).

A minimum requirement for own funds and eligible liabilities (MREL) will be gradually set for banks in 2019…

The MREL is intended to create conditions for the resolution of a bank's potential failure, limit the use of public money in the resolution and reduce the impacts of the failure on the real economy and the financial system.[26] The MREL includes an absorption amount, consisting of the current Pillar 1 and Pillar 2 capital, to cover the failed bank's potential losses.[27] Moreover, specified banks that are important financial service providers will also be obliged to maintain a recapitalisation amount. This is designed to safeguard the minimum regulatory capitalisation of the bank as a going concern and to sustain market confidence after the resolution. The minimum MREL recapitalisation amount will be equivalent to the Pillar 1 and Pillar 2 capital requirements and can be met by the bank using internal (intra-group) or external eligible liabilities or capital, or a combination thereof.

…capital surpluses can support compliance with the MREL

Domestic banks do not have sufficient liabilities that meet the requirements for eligible liabilities. They may thus partially satisfy the MREL (the recapitalisation amount) by using capital surpluses. However, this could affect their ability to respond to changing economic conditions and limit the use of capital surpluses as a potential source to cover increased capital requirements. The CNB will therefore analyse banks' approaches to complying with the MREL on an ongoing basis in connection with the interpretation of stress test results and the calibration of cyclical and structural capital buffers.

23 The EU financial sector accounted for 626% of EU GDP at the end of 2017. More recent data are not available for all Member States.
24 The banking sector also includes credit unions due to the low total assets of the latter relative to the former.
25 The Czech Export Bank and the Czech-Moravian Guarantee and Development Bank are excluded from the analysis of the capital of the banking sector as a whole in the entire section 3.2. This is because these banks are wholly owned by the Czech state (providing implicit state guarantees for their liabilities) and have different business models and volatile credit portfolios.
26 For more details see the thematic article Kahoun, T. (2019): *Minimum Requirement for Own Funds and Eligible Liabilities (MREL): General Approach of the Czech National Bank*.
27 Combined capital buffers are not included in the calculation of the MREL.

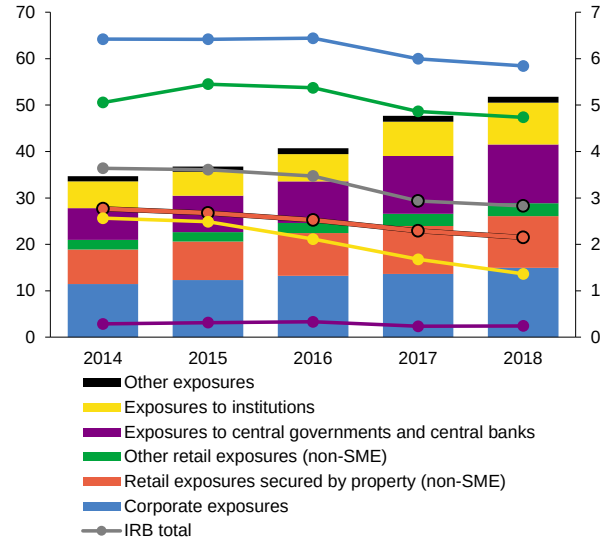
The capitalisation of some banks may not be sufficient in an adverse phase of the financial cycle

In the *Adverse Scenario* of the CNB's macro stress tests (see section 4.1), the capital ratio of the banking sector as a whole does not fall below the Pillar 1 and Pillar 2 capital requirements (the total capital requirement). However, this does happen in individual cases. A total of 11 banks, including one systemically important bank, would fail to meet the total capital requirement.

Chart III.3

Average risk weights and the size of the main categories of exposures under the IRB approach

(%; right-hand scale: CZK trillions)



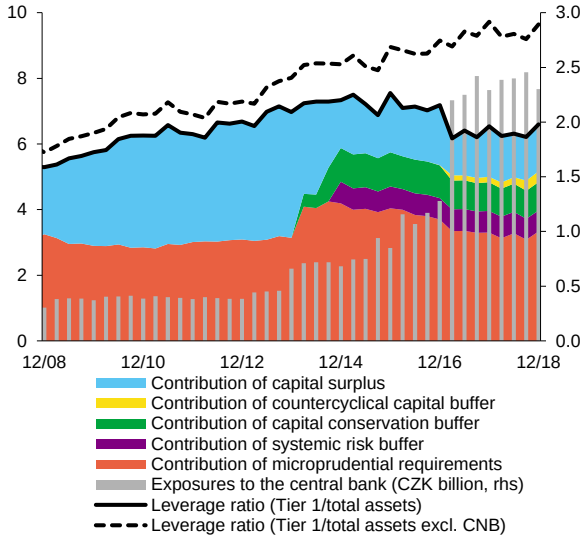
Source: CNB

Note: The points connected by lines denote the level of the risk weights for individual categories of exposures (left-hand scale). The height of the columns denotes the size of the exposure (right-hand scale). The colour coding of the points corresponds to the colour coding of the columns.

Chart III.4

Structure of the leverage ratio by capital sources

(%; right-hand scale: CZK trillions)



Source: CNB

Note: Due to unavailability of data in a longer time series, the denominator of the leverage ratio contains total assets (including exposures to the CNB) and the capital surplus consists of total capital (not just Tier 1 capital).

The aggregate risk weights for exposures under the IRB approach continued to decline in 2018

The downward trend in the aggregate risk weights derived from internal (IRB) models (CZK 5.2 trillion, or 71.5% of the banking sector's exposures) continued in 2018 (a decline of 1.1 pp to 28.3%).[28] The average risk weights fell across all the main exposure categories (see Chart III.3), including house purchase loans (by 1.4 pp to 21.5%). The decline largely reflects the favourable economic situation, which is being accompanied by a low incidence of negative credit events and a favourable recovery rate owing to rising property prices and related favourable conditions for selling collateral.[29] The decline in risk weights for loans for house purchase may also be due to a CNB recommendation[30] limiting the provision of potentially riskier loans, which may be affecting the risk parameters of banks' internal models.

28 The analysis of risk weights uses data on implicit risk weights. These are calculated as the risk-weighted value of the exposure divided by the value of the exposure under the COREP single European reporting framework.

29 For details on the risk of procyclicality of risk weights under the IRB approach, see Brož, V., Pfeifer, L., Kolcunová, D. (2018): *The Pro-Cyclicality of Risk Weights for Credit Exposures in the Czech Republic*, CNB WP 12/2018 and Brož, V., Pfeifer, L., Kolcunová, D. (2017): *Are the Risk Weights of Banks in the Czech Republic Procyclical? Evidence from Wavelet Analysis*, CNB WP 15/2017.

30 Recommendation on the management of risks associated with the provision of retail loans secured by residential property – see https://www.cnb.cz/en/financial-stability/macroprudential-policy/recommendation-on-the-management-of-risks-associated-with-the-provision-of-retail-loans-secured-by-residential-property/.

The prolonged decline in risk weights may be increasing the banking sector's vulnerability

The lower capital requirements applying to lending (lower risk weights) may be incentivising credit expansion in the relevant portfolios. The stronger decline in risk weights for retail loans secured by property relative to that for corporate loans (22.3% and 9.0% respectively in 2014–2018) was accompanied by growth in their share in loans to the private non-financial sector of 7.8 pp (to 45.7%). Other things being equal, a lower volume of capital linked to housing loans has an upward effect on return on equity. This thus creates an incentive to prioritise growth in this portfolio, which is accompanied by growth in concentration. Such concentration may lead to an increase in the banking sector's vulnerability if risks materialise. All else unchanged, a decline in risk weights also reduces the absolute amount of capital required for the relevant exposures by the capital regulations and may thus further increase the sector's vulnerability. Macroprudential policy approaches to mitigating the risks arising from falling risk weights are discussed in more detail in Box 3.1.

The leverage ratio has increased slightly

Following the transposition of the new CRR II/CRD V legislative framework (see Box 5.1 for more details), the leverage ratio should act as a (non-risk-weighted) prudential backstop against risks associated with low risk weights.[31] It rose by 0.1 pp year on year to 6.6% at the end of 2018 (see Chart III.4). The slight growth in the leverage ratio was due to stronger year-on-year growth in capital (4.9%) than in the banking sector's balance and off-balance sheet (4%). The situation could nevertheless change in the event of a turnaround in the business cycle, when a potential release of the countercyclical capital buffer, use of the conservation capital buffer and a decrease in capital surpluses could cause the leverage ratio to decline to about 4% (see Chart III.4), close to the 3% level that will represent the minimum leverage ratio requirement after the transposition of CRR II/CRD V. Domestic banks still hold a large part of their balance sheets (31.6%) as exposures to the central bank. This reflects a sharp rise in the CNB's international reserves during the exchange rate commitment in 2013–2017. The leverage ratio adjusted for exposures to the central bank went up by 0.4 pp year on year to 9.6%. However, the new European CRR II/CRD V legislation does not include the option to adjust the denominator of the leverage ratio for exposures to the central bank under exceptional macroeconomic circumstances, even though the Basel Committee on Banking Supervision allows banks to do so (see Box 5.1).

BOX 3.1: POSSIBLE MACROPRUDENTIAL POLICY RESPONSES TO A DECLINE IN RISK WEIGHTS FOR RETAIL EXPOSURES SECURED BY RESIDENTIAL PROPERTY IN THE CZECH REPUBLIC IN AN EXPANSIONARY PHASE OF THE CYCLE

The decline in risk weights observed in a sustained expansionary phase of the cycle can make some banks more vulnerable in certain circumstances (see section 3.2.1). One such situation is that where the capital requirement for the relevant risk weight reaches a level where capital does not cover unexpected losses in the event of a shock. In this regard, the CNB pays particular attention to the risk weights of banks using the IRB approach to setting the capital requirement for credit risk, especially for exposures secured by residential property (the mortgage portfolio; see Chart III.3).

To assess the relevance of risks associated with falling risk weights for IRB exposures secured by residential property, a sensitivity analysis of the capital requirement for the mortgage portfolio was conducted using the methodological framework for the CNB's stress tests. The starting point for the analysis was the *Adverse Scenario* of the five-year macro stress test conducted in December 2018 (*Risks to financial stability and their indicators – December 2018*, section 3.3). The scenario was designed to contain the risk characteristics of a major crisis in the real estate sector. During the crisis, PD increases five times and LGD goes up by 25 pp over one year. These figures correspond to those

31 See Pfeifer, L., Hodula, M., Holub, L., Pikhart, Z. (2018): *The Leverage Ratio and Its Impact on Capital Regulation*, CNB WP 15/2018.

recorded during the real estate crisis in Spain in 2012–2013 and were applied in a similar sensitivity analysis conducted by the Belgian macroprudential authority when it introduced a risk weight add-on for IRB banks. The modified adverse scenario would result in losses leading to a fall in the capital ratio from 18.7% to 9.2% in the domestic banking sector over the five-year horizon. This decrease is 0.7 pp larger than in the standard December 2018 *Adverse Scenario*.[32] However, it can be said that the domestic banking sector as a whole would stay above the 8% regulatory minimum and show sufficient resilience in the event of a strong crisis in the residential property sector despite a significant impact on capital. Setting minimum risk weights for the mortgage portfolio in the Czech Republic is thus not necessary at the moment.[33]

The CNB will nonetheless continue to closely monitor the risk weights for IRB exposures secured by residential property. It stands ready to use appropriate tools if there are indications that banks are insufficiently resilient to shocks to the mortgage portfolio. One option is to affect the level of risk weights by applying Article 458 of the CRR. The CNB assessed its potential application in FSR 2015/2016 (section 4.3.2) and concluded that the conditions for doing so had not been met.[34] Compared with countries that actively apply Article 458 of the CRR in the area of risk weights for the mortgage portfolio (Belgium, Finland and Sweden), the Czech Republic is still in a relatively good position – the current risk weights in the Czech Republic are significantly higher despite showing a downward tendency, and household debt is relatively low (Table III.1 Box). The CNB is also active in applying macroprudential measures that relate directly or indirectly to property exposures (LTV, DTI, DSTI and CCyB).[35]

A possible alternative to the use of Article 458 of the CRR is to apply the sectoral systemic risk buffer (SRB) contained in the proposed revision of CRR II/CRD V (see Box 5.1). However, the practical use of the sectoral SRB will be affected by the speed at which the new rules are implemented into the national legislation (prospectively around 2020/2021) and may be subject to application complications, such as overlaps with other macroprudential capital instruments.

Lastly, the issue of risk weight levels should be considered in the broader context of other planned regulatory measures such as the setting of an output floor for risk weights under the Basel III reform package and the EBA guidelines on appropriate inclusion of data from the crisis years in banks' internal models.[36] Both these measures may potentially foster higher risk weights for the mortgage portfolio as well. Setting the output floor on the simplified assumption of it being binding for individual portfolios[37] would mean setting the risk weights for IRB exposures secured by residential property at 22.3%, i.e. around 0.8 pp higher than the current average implicit risk weights (see section 3.2.1).[38] The EBA guidelines may imply that banks will use higher PD and LGD levels (and hence higher

32 However, the demonstrated resilience is largely conditional on the banking sector's capital surpluses (see section 3.2.1). The conclusion of the December 2018 macro-stress test result regarding the role of the capital surplus thus still applies – the capital ratio would fall below the 8% regulatory minimum over the test horizon if banks did not maintain such a surplus voluntarily.

33 Nevertheless, the introduction of minimum risk weights would not necessarily be too costly for banks in terms of capital. According to the results of the analysis in Box 3.2 in FSR 2017/2018, which quantified, among other things, the impact of setting minimum risk weights for domestic banks' capital surpluses at 25%, such a limit would be constraint for four domestic banks. The capital surplus of the banking sector would drop by CZK 2.9 billion (or 0.6% of the banking sector's total capital).

34 The results of the analysis showed that the risk weights for the mortgage portfolio in the Czech Republic were high relative to those in other European countries, the PD and LGD settings were mostly prudent and the loss experience was low. The analysis also pointed out that Article 458 is materially and administratively demanding to apply and requires the involvement of a number of EU bodies.

35 On the other hand, the residential property market in the Czech Republic is showing signs of overvaluation amid elevated growth in mortgage loans (see section 5.2). It should also be noted that all the countries applying Article 458 of the CRR received a warning in the area of risks on the residential property market and property financing loans from the ESRB before doing so.

36 For details see https://www.bis.org/bcbs/publ/d424.pdf and https://eba.europa.eu/regulation-and-policy/model-validation/guidelines-on-pd-lgd-estimation-and-treatment-of-defaulted-assets

37 However, the output floor will be calculated at the level of the portfolio as a whole.

38 The analysis assumed binding revised Basel III rules setting different risk weights for different LTV intervals (see Box 5.2 in FSR 2017/2018). The current 35% risk weight for exposures secured by property under the STA approach is therefore not considered. Under this assumption, the risk weight under the IRB approach implied by the fully implemented output floor would be 25.4%.

risk weights) than those implied by the current "through-the-cycle" (TTC) values affected by the relatively long favourable phase of the cycle.[39]

Table III.1 Box

Comparison of the situation in countries applying Article 458 of the CRR in the risk weight area at the time of notification with the current situation in the Czech Republic

Country	Belgium	Finland	Sweden	Czech Republic
Notification	July 2017	August 2017	May 2018	-
Effect of measures	April 2018	January 2018	December 2018	-
IRB risk weights for exposures secured by residential property at the time of notification	9.7%	8%	3–13%	21.5%
Household debt/GDP	60.9%	65.7%	88.2%	31.4%
Growth in property transaction prices (year on year, 4-year average)	1.2%	0.3%	9.4%	6.3%
Property price overvaluation	10%	N/A	30–65%	Over 10%
Growth in mortgage loans (year on year)	5.3%	2%	5–9% (2014–2018)	8.3% (September 2018)
Macroprudential measures in the area of real estate exposures	No	Hard LTV limit of 90% (95% for first time buyers) since 2016	Hard LTV limit of 85% since 2010 + amortisation requirement since 2016	Measure focused on loan applicants (LTV, DTI/DSTI) since June 2015 and June 2017 respectively
Use of CCyB	No	No	Currently 2% (2.5% from September 2019)	Currently 1.25% (2.00% from July 2020)

Source: CNB, ESRB, EBA, national authorities, Eurostat, IMF

3.2.2 Credit Risk

The current approach to credit risk is both backward- and forward-looking

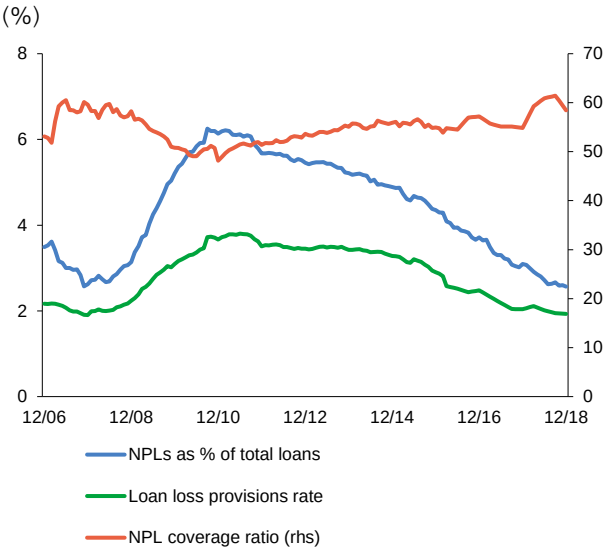
For the assessment of credit risk, the IFRS 9 accounting standard requires correct and timely recognition of both materialised credit risks (a backward-looking view), when loan impairment has already taken place (non-performing loans – NPLs, Stage 3 – impaired) and future expected credit risks (a forward-looking view) for loans that do not currently show any evident signs of impairment (performing loans, Stage 1 – no increase and Stage 2 – increase). Banks cover recognised materialised and future expected credit risks with provisions.

Materialised risks, as measured by the non-performing loans ratio, are at their lowest level since 2007…

The ratio of NPLs (Stage 3) to total loans went down by 0.5 pp in 2018 to 2.6% at the year-end (see Chart III.5). The lowest NPL ratio since 2007 was reached through a combination of an increase in total loans (accounting for 42%) and a decrease in NPLs (accounting for 58%).

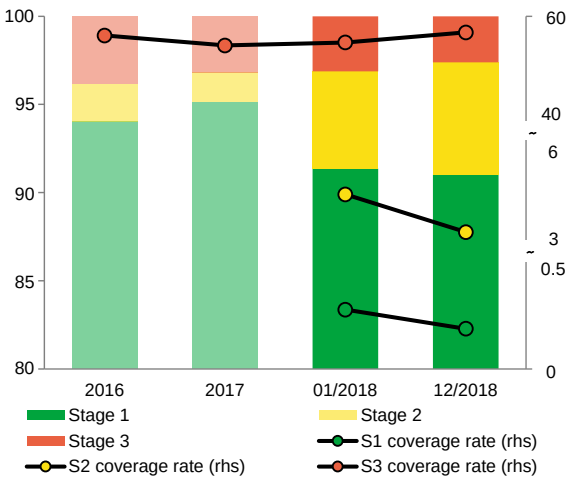
39 The TTC values are set with an eight-year time scale for domestic banks using the IRB approach.

Chart III.5
Non-performing loans and provisions in the domestic banking sector



Source: CNB

Chart III.6
Structure and coverage of client loans



Source: CNB
Note: The graphical illustration of the changes in coverage ratios corresponds to their relative changes. The loan breakdown for 2016 and 2017 corresponds to the classification into standard, watch and loss loans under the former IAS 39 standard. Under the new IFRS 9 accounting standard (in effect since 1 January 2018), non-performing loans (NPLs) correspond to loans classified in Stage 3 – impaired loans.

…and coverage of NPLs by provisions seems sufficient

Coverage of NPLs by provisions did not change materially in the household sector and rose slightly in the non-financial corporations sector. The increase in the NPL coverage ratio in the non-financial corporations sector was due to slower release of provisions (-2.3%) by comparison with the rate of decline in NPLs (-8.7%).[40] Overall, the total coverage of NPLs for both the household and non-financial corporations sectors reached 57.5% at the end of 2018 and has risen by 2.4 pp since the introduction of IFRS 9. Given the losses recorded historically and the conservative loss projections in macro-stress tests (see section 4.1.1) in the case of NPLs,[41] the NPL coverage ratios in individual sectors seem sufficient.

Revisions to banks' IFRS 9 methodologies led to large realignments inside the performing loan portfolio

The changes in the volume of performing loans in Stage 2 during 2018 were related to revisions made to banks' IFRS 9 methodologies for shifting exposures between Stage 1 and Stage 2. The weight of performing loans with no increase in credit risk (Stage 1) in performing loans fell by 0.9 pp to 93.5% between the start and end of 2018 (see Chart III.6). This decrease primarily reflected a significant rise in total performing loans with increased credit risk (Stage 2, +22.6%), which outweighed the increase in loans in Stage 1 (+5.6%) related to credit growth (see section 5.2). The ratio of loans with increased risk (Stage 2) to performing loans thus reached 6.5% at the end of 2018.

40 The switch to the new IFRS 9 accounting standard in early 2018 was accompanied by a one-off increase in both provisioning and the coverage of loans by provisions. For the sake of comparability over the period under review, the year-on-year comparisons in the rest of section 3.2.2 therefore use the initial values as of 31 January 2018.

41 Banks' NPL losses are available from the results of the recovery rate survey that the CNB conducts every two years among the nine most important banks and building societies (the most recent round of the survey took place in March 2017). In this survey, banks state their actual and expected NPL recovery rates broken down into several categories of loans to non-financial corporations and households. For the purposes of the sectoral analysis of NPL coverage by provisions, NPL losses are calculated as (1 - the recovery rate).

Expected credit losses on performing loans are low…

The coverage of performing loans in the household sector at the end of 2018 was equal to that just after the introduction of IFRS 9 in January 2018 (0.45%). In the case of non-financial corporations, the coverage of performing loans fell gradually during 2018 (by 6 bp to 0.52%). The coverage ratios in Stage 1 (see Chart III.7 and Chart III.8) dropped in both sectors mainly due to weaker growth and, in the case of non-financial corporations, a decrease in provisions. The coverage ratios in Stage 2 dropped sharply during 2018. Transfers of exposures accompanied by only limited increases in provisions led to a drop in the coverage ratio in Stage 2 in the household sector by 1.2 pp to 4.2%.[42] The perceived expected loan losses are therefore at very low levels.[43]

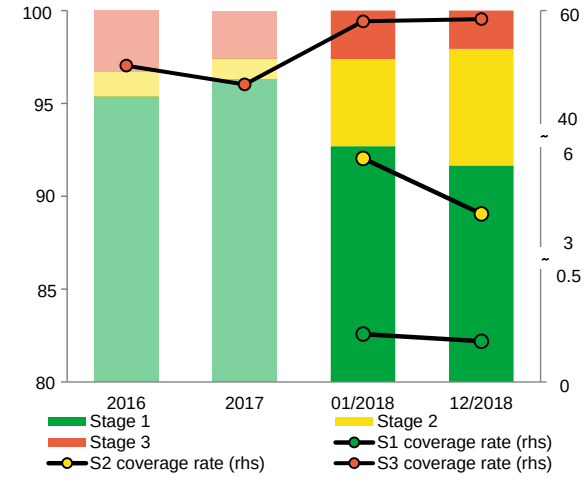
…and are supporting a more prudential approach to setting the countercyclical capital buffer

For banks, the introduction of the new IFRS 9 accounting standard entailed considerable effort and investment in developing model-based approaches, methodologies, internal processes and data and IT infrastructure. The implementation process is associated with an increased need to understand model interactions and the behaviour of expected credit losses over the cycle. Looking ahead, model-based approaches can be expected to develop further given that the standard in many areas allows considerable discretion with a major effect on the final expected credit losses. From the macroprudential policy perspective, the trend observed so far, where the provisions do not differ significantly in size from those created under the IAS 39 standard, is supporting a more prudential approach to setting the countercyclical capital buffer (see Box 3.2).

Chart III.7

Structure and coverage of loans to households

(%)

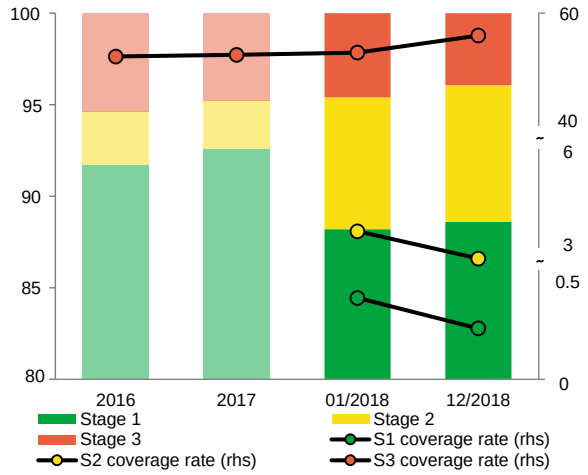


Source: CNB
Note: The graphical illustration of the changes in coverage ratios corresponds to their relative changes. The loan breakdown for 2016 and 2017 corresponds to the classification into standard, watch and loss loans under the former IAS 39 standard. Under the new IFRS 9 accounting standard (in effect since 1 January 2018), non-performing loans (NPLs) correspond to loans classified in Stage 3 – impaired loans.

Chart III.8

Structure and coverage of loans to non-financial corporations

(%)



Source: CNB
Note: The graphical illustration of the changes in coverage ratios corresponds to their relative changes. The loan breakdown for 2016 and 2017 corresponds to the classification into standard, watch and loss loans under the former IAS 39 standard. Under the new IFRS 9 accounting standard (in effect since 1 January 2018), non-performing loans (NPLs) correspond to loans classified in Stage 3 – impaired loans.

42 This can nonetheless be attributed largely to ongoing methodological revisions relating to the implementation of IFRS 9. Adjusted for methodological changes, the coverage ratio in Stage 2 fell by 0.3 pp to 5.1% amid unchanged total coverage of performing loans in the household sector.

43 Provisions for performing loans in the household and non-financial corporations sectors amounted to around CZK 14 billion at the end of 2018, accounting for 21.8% of the total volume. The value of provisions for NPLs in Stage 3 was roughly CZK 51 billion.

BOX 3.2: THE IMPACT OF BANKS' EXPECTATIONS ON TIMELY AND SUFFICIENT PROVISIONING UNDER IFRS 9

Under IFRS 9, which has been in force internationally since 1 January 2018, banks should, when provisioning, take into account all available information about current and future macroeconomic developments and their effects on the credit risks of relevant exposures. Under this assumption, banks should thus create sufficient provisions to cover their expected credit losses before the business and financial cycle changes, i.e. in the period of still favourable economic conditions, when they are usually profitable. In contrast to the previous IAS 39 standard, which was based on an inherently procyclical concept of incurred losses,[44] IFRS 9 should thus have a positive impact on the stability of banks during crises.

Some studies nevertheless point to the possibility of procyclical behaviour even under IFRS 9.[45] According to these studies, banks' approaches in the growth phase of the cycle may not be sufficiently forward-looking and may lead to the creation of larger provisions than necessary to cover the relatively low credit losses arising from the favourable economic conditions. A sudden and sustained change in the business and financial cycle may then cause a "cliff effect" where banks will be forced to create large amounts of provisions in a relatively short period of time. This may in turn be reflected in a sharp fall in capital adequacy and a credit crunch (see FSR 2017/2018).

When considering the procyclicality of IFRS 9, it is useful to break down the factors influencing provisioning conceptually into two components. The *credit risk component* of a portfolio is associated with a decrease in the quality of the current credit portfolio based on the usual risk criteria (banks' internal ratings, number of days past due etc.). The reclassification of a large part of a credit portfolio into the category of loans with significantly increased credit risk, i.e. the transfer of assets from Stage 1 to Stage 2, where the horizon of the expected loss estimate is changed from one year to the maturity of the loan, can give rise to the creation of a large volume of provisions.[46]

The *expected macroeconomic developments component* is linked to the incorporation of macroeconomic forecasts into internal credit risk models. Provisions are created in large amounts when a deterioration in the macroeconomic conditions is reflected in the risk parameters in banks' internal models and, in turn, in their estimates of expected credit losses. Moreover, a deterioration in risk parameters may signal a significant increase in credit risk, thereby itself becoming a reason for transferring assets between Stage 1 and Stage 2, which further increases the provisioning. This component of provisioning emerged with the introduction of IFRS 9. The effectiveness of IFRS 9 compared with the previous IAS 39 will thus be influenced to a large extent by banks' success in forecasting future macroeconomic developments.

44 See Beatty, A., Liao, S. (2011): *Do Delays in Expected Loss Recognition Affect Banks' Willingness to Lend?* Journal of Accounting and Economics, 52(1), pp. 1–20, and Pool, S., de Haan, L., Jacobs, J. (2015): *Loan Loss Provisioning, Bank Credit and the Real Economy*, Journal of Macroeconomics, 45(C), pp. 124–136.

45 See Abad, J., Suárez, J. (2017): *Assessing the Cyclical Implications of IFRS 9 – A Recursive Model*, ESRB Occasional Paper No. 12, July, and Krüger, S., Rösch, D., Scheule, H. (2018): *The Impact of Loan Loss Provisioning on Bank Capital Requirements*, Journal of Financial Stability, 36(1), pp. 114–129.

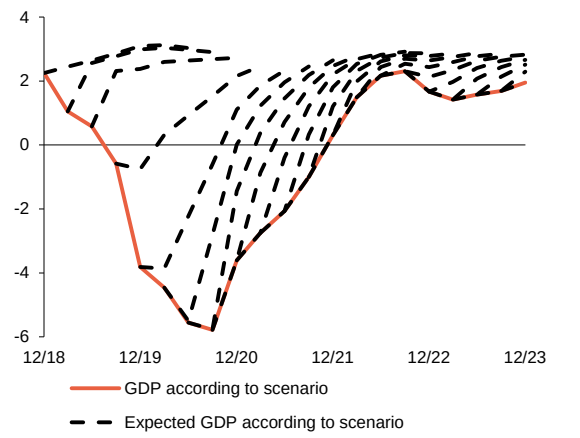
46 Exposures should be transferred between Stage 1 and Stage 2 in the event of a significant increase in credit risk. However, the IFRS 9 guidelines do not clearly define this and merely suggest a criterion of 30 days past due.

Forecasting models often fail to estimate changes in the business cycle and tend to return to the steady state even after a significant change in economic conditions. This was confirmed during the last crisis.[47] In the next part of this box, in order to assess the real impact of IFRS 9, we therefore consider a scenario in which banks' forecasting ability is limited (the "limited forecasting ability scenario"). Chart III.1 Box illustrates banks' GDP growth forecasts in this scenario versus actual GDP growth.

Chart III.1 Box

GDP growth forecast based on the limited forecasting ability scenario

(%)

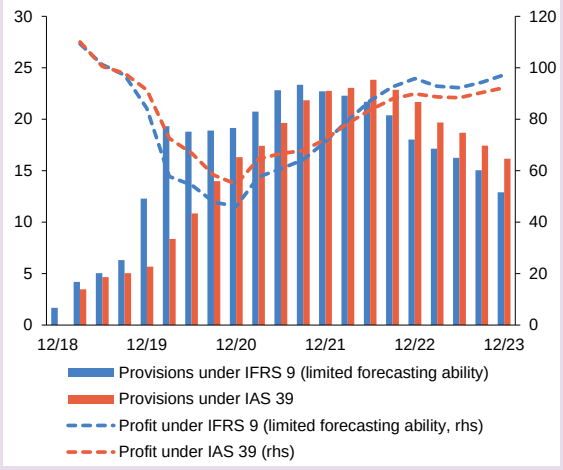


Source: CNB
Note: The figures for the limited expectations scenario were obtained by combining the *Baseline Scenario* and the *Adverse Scenario* for the macro stress tests on the basis of Bayesian inference.

Chart III.2 Box

Illustrative profiles of provisioning and profits under IFRS 9 and IAS 39

(CZK billions)



Source: CNB

In the limited forecasting ability scenario, banks' provisions would rise sharply at an advanced stage of contraction of the cycle rather than immediately after the change in economic conditions (see FSR 2017/2018). This rise would be due to both the above-mentioned components simultaneously, as banks' expectations about future macroeconomic developments would worsen in a situation of decreasing credit portfolio quality. The increased provisioning would therefore originate both in the reflection of the macroeconomic deterioration in the risk parameters of internal models (the *expected macroeconomic developments component*) for exposures in a given credit risk stage, and in the fulfilment of the criteria for reclassifying exposures between Stage 1 and Stage 2 (the *credit risk component*). Moreover, the creation of a large volume of provisions might coincide with a rise in risk weights in the IRB approach, which would increase the capital requirements. This coincidence of negative factors would affect banks at a time of potentially falling profitability due to, among other things, decreasing credit activity (see Chart III.2 Box). The negative impact of these effects would be greater in the case of a longer-lasting and deeper contraction of the cycle associated with a sharp drop in profitability.

In the limited forecasting ability scenario, the *expected macroeconomic developments component*, which should ensure that provisions are created in a timely fashion and to a sufficient extent in economic good times, might be less

47 Zidong, A., Jalles, J. T., Loungani, P. (2018): *How Well Do Economists Forecast Recessions*, IMF WP 18/39.

than fully functional. In that case, IFRS 9 would not serve its intended purpose and the timing of provisioning over the financial and business cycle might not differ much from that under the previous IAS 39. The risks associated with limited forecasting ability should therefore be taken into account not only in the setting of the countercyclical capital buffer rate (FSR 2017/2018), but also in the timing of the release of the buffer. The reasons for releasing it should include clear signals of risk materialisation, as reflected in a rise in provisions and risk weights and a fall in the capital ratio.

3.2.3 Profitability and Liquidity

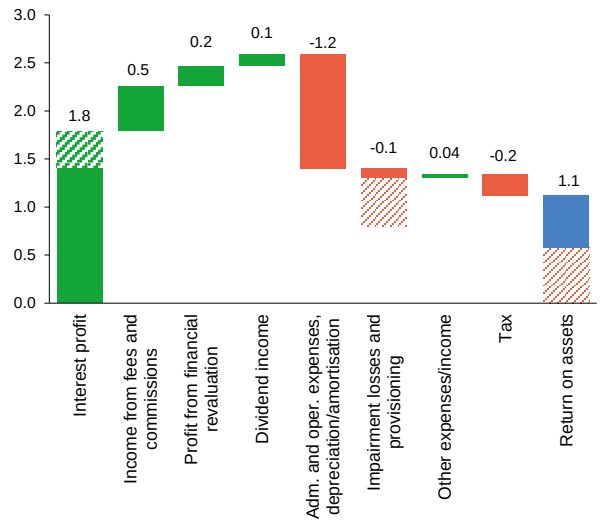
The profitability of the banking sector remains high, due in part to growing interest profit…

The banking sector turned in a profit of CZK 82.1 billion at the end of 2018, a rise of 8.9% on a year earlier. Return on assets remained flat at 1.1%. Large differences persist across the groups of banks (see Chart III.2 CB). Large and medium-sized banks showed highest return on assets (1.2%). Interest profit has long been the main source of profitability (see Chart III.9). It rose by 15.8% on a year earlier. Exposures to the central bank recorded an increasing share in total interest profit (29.6% of total interest profit; see Chart III.10), fostered significantly by increases in monetary policy rates. Interest profit solely on client loans recorded year-on-year growth of 6.9%.

Chart III.9

Decomposition of return on assets

(%)



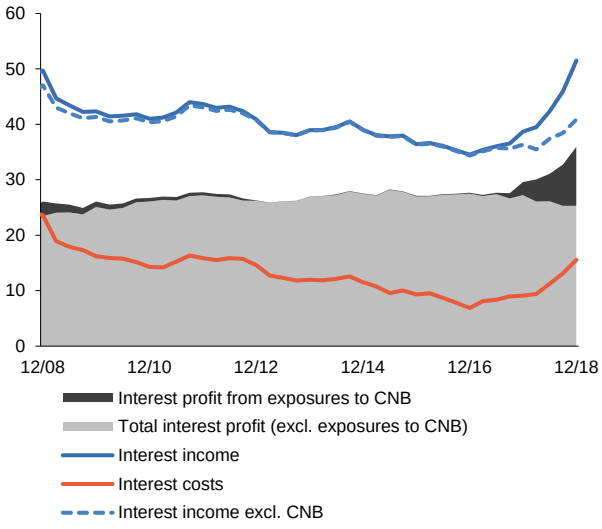
Source: CNB

Note: The given value represents the ratio of the given type of income/expense to the level of assets. The red hatching represents the level of impairment as of 2009 Q4 (the highest impairment level in the period under review) and its potential impact on return on assets in 2018 Q4. The green hatching denotes the ratio of interest profit from exposures to the central bank.

Chart III.10

Decomposition of interest profit

(quarterly contributions in CZK billions)



Source: CNB

…which is being supported by rising interest margins in view of very gradual growth in deposit rates

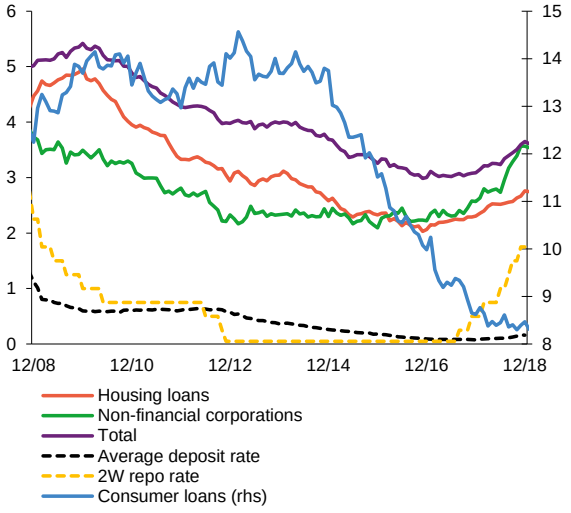
In the case of loans to the private sector, the growth in interest profit was driven by an increase in client loans (of 7.2%) and also by a rising interest margin on new loans (the difference between rates on new loans and deposits). The aggregate margin went up by 0.57 pp year on year to 3.65 pp. Margins increased in year-on-year terms for all types of loans except

consumer credit (see Chart III.11). On the one hand growth in margins is being reduced by persisting competition, but on the other it is being boosted by slower transmission of monetary policy rates to deposit rates than to loan rates. The 2W repo rate increased by 1.25 pp year on year, while the average household deposit rate went up by just 0.08 pp, due mainly to the high share of deposits held by households on their current accounts. Year-on-year growth in deposit rates was very mixed across the groups of banks (see Chart III.12). Small banks recorded the largest rise in rates (0.12 pp) and the highest growth in deposits (14.5%).

Chart III.11

Domestic banks' interest margins on new loans

(pp)

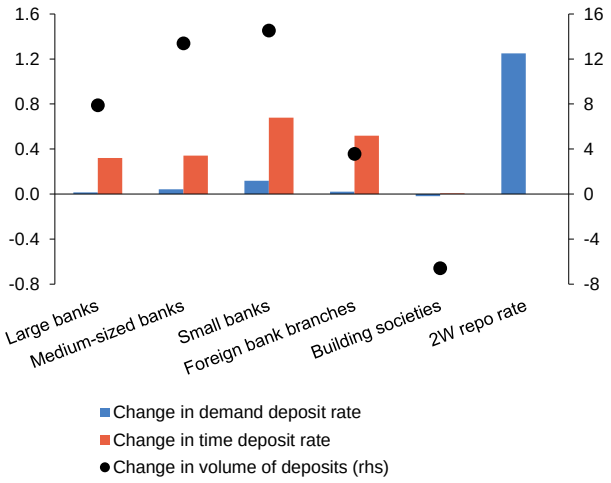


Source: CNB
Note: Margins are calculated as loan rates for the given sector minus the average deposit rate. The non-financial corporations item excludes revolving loans and credit cards.

Chart III.12

Year-on-year change in deposit rates versus the 2W repo rate

(pp; right-hand scale: CZK billions)



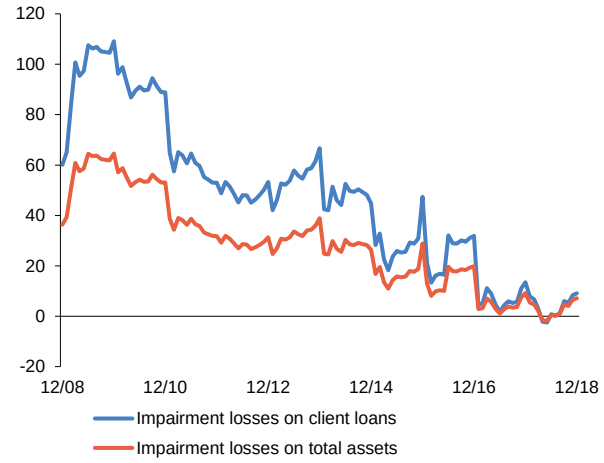
Source: CNB

Profit is also being kept high by low impairment losses

Banks' profitability is also being favourably affected by a continued decline in impairment losses (see Chart III.13), which is linked to the phase of the business cycle and the falling share of NPLs and provisions (see section 3.2.2, Chart III.5). However, the current level of provisions may not correspond to the real long-term risks if banks' expectations regarding future economic developments are overly optimistic (see Box 3.2). An insufficiently anticipated change in the phase of the business and financial cycle thus poses a key risk to profitability. If the ratio of impairment losses on client loans were to increase to the end-2009 level,[48] the banking sector's profit would drop by 39.6% year on year to CZK 45.8 billion. Adjusted simultaneously for all interest income on exposures to the central bank, profit would decrease further to CZK 18.8 billion. The CNB is responding to these risks by gradually raising the countercyclical capital buffer rate (see section 5.2).

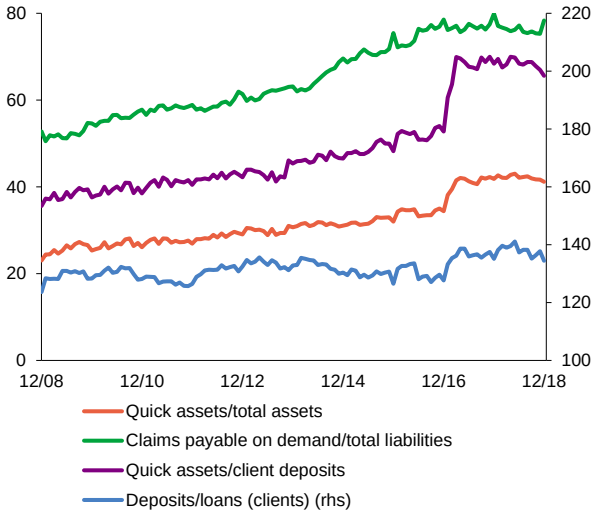
48 This period was characterised by growth in NPLs connected with the Great Recession.

Chart III.13
Asset impairment losses
(bp)



Source: CNB

Chart III.14
Liquidity ratios in the banking sector
(%)



Source: CNB

The liquidity position remains very good

The ratio of quick assets to total assets fell by 0.7 pp year on year but remains very high at 41.6% (see Chart III.14). Quick assets saw no major changes in structure, with exposures to the central bank (76,7%) and exposures to the government (19.8%) remaining the most important items. The good liquidity position is illustrated by a high ratio of client deposits to loans (134.5%) and by the liquidity coverage ratio (LCR), which rose by 7.6 pp year on year to 189.9% at the end of 2018 and thus remains well above the regulatory requirement of 100% (see section 4.2 for details).

3.2.4 Credit Unions

The importance of the credit union segment continues to wane

With the exception of credit risk indicators, the year-on-year changes in the indicators under review in the credit union segment were mostly positive (see Table III.1). The segment saw a major change at the end of 2018 when the largest entity (Moravský peněžní ústav), which accounted for around 46% of its assets (CZK 9.2 billion), was granted a banking licence by the CNB. Following the conversion of its two largest entities into banks (CREDITAS in 2016, MPÚ in 2018), the credit union segment has decreased significantly in importance since 2016 and cannot be a source of systemic risk in its current form.

Table III.1
Selected indicators of credit unions
(%; credit unions active as of 31 December 2018)

	2016 Q4		2017 Q4	2018 Q4	
	including CREDITAS	excluding CREDITAS		including MPÚ	excluding MPÚ
Assets (CZK billions)	34.2	22.4	23.1	20.2	11.0
Client NPL ratio	24.2	30.4	25.3	30.8	27.3
Quick assets/total assets	14.9	14.3	17.0	17.4	25.4
Coverage of NPLs by provisions	19.5	14.7	12.8	10.5	11.1
Tier 1 capital ratio	16.6	17.5	18.6	21.1	23.9
RoE	-0.8	-0.4	-1.1	0.1	-0.4

Source: CNB
Note: The accounting period is not unified across the credit union segment, so the relevant data were annualised for some institutions.

3.3 THE NON-BANK FINANCIAL SECTOR

Non-bank financial institutions complement the range of products provided by the financial sector mainly by providing traditional insurance products offering hedging against life and non-life asset risks (insurance companies) and investment products offering alternative ways of growing savings (investment funds) or building up and growing retirement savings (pension management companies and funds). Non-bank providers of financial assets expand the range of credit products traditionally provided by banks.

Investments managed by domestic non-banks grew further…

Households' interest in investing their savings on financial markets remained high in 2018 (see Chart II.17 CB and Chart III.1). The importance of investment and pension funds continued to rise. This was accompanied by year-on-year growth in these segments' assets. A slight year-on-year increase in insurance companies' assets was due mainly to continued interest in non-life products.

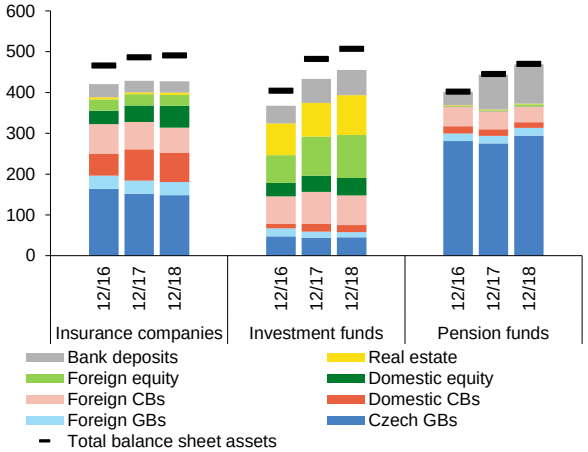
…the structure of investment portfolios stabilised

Investment funds' balance sheets remained dominated by shares; the share of real estate investment also increased slightly (see Chart III.15). Insurance companies saw a rise in direct shares due to acquisition activity in the domestic insurance sector. The year-on-year growth in pension funds' assets was reflected in higher holdings of Czech government bonds. The downward trend in their share in domestic institutional investors' balance sheets thus halted. This partly reflected a relative increase in the attractiveness of Czech government bonds to domestic investors due to growth in their yields during 2018 (see section 2.1). Given the partial exit from the low-yield environment, the incentive to "search for yield" weakened. This resulted in a halt in growth in the share of corporate bonds.

Chart III.15

Investment assets of domestic institutional investors

(CZK billions)



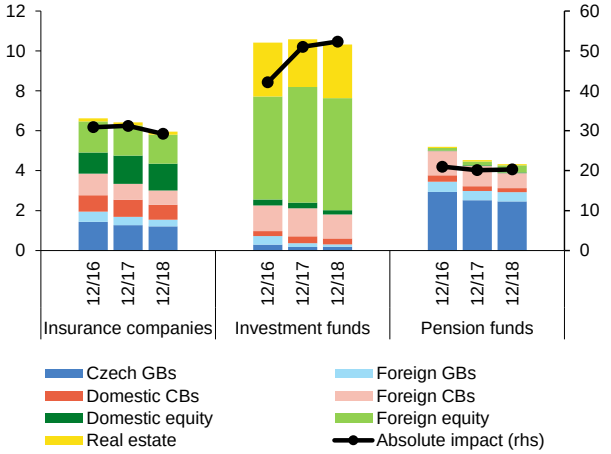
Source: CNB

Note: GBs = government bonds. CBs = corporate bonds including mortgage bonds. The look-through approach was applied directly or by means of approximation in the case of shares in investment funds. This means that these shares were assigned to financial asset categories (bonds, shares and other equity, real estate) depending on the asset composition or investment orientation of the investment fund concerned.

Chart III.16

Sensitivity analysis results

(% of total investment assets; right-hand scale: CZK billions)



Source: CNB

Note: GBs = government bonds. CBs = corporate bonds including mortgage bonds. The look-through approach was applied directly or by means of approximation in the case of shares in investment funds.

The increasing importance of investment products exposes households to market risk…

If risk premia were to increase suddenly and financial asset prices were subsequently to drop, households might respond to the decline in the value of their assets with a higher number of withdrawals or requests to redeem investment products.[49] A higher rate of such withdrawals might lead to exhaustion of the liquidity reserves of funds or insurance companies. They would have to respond to further withdrawal requests by selling off less liquid assets. This could exacerbate the initial drop in asset prices and lead to a spiral between withdrawals and price falls with a potentially systemic dimension.

…which is highest for investment funds

The CNB used a sensitivity analysis to assess the possible extent of the drop in the value of investment assets should this risk materialise. The analysis was aimed at identifying differences in the riskiness of the individual segments' portfolios and the evolution of that riskiness over time, not at assessing the resilience of individual segments to a market shock.[50] The sensitivity analysis assumed materialisation of the market risks identified at the end of 2018. This meant a decline in prices of traded shares of 30%–35% depending on their geographical location and a decline in property prices of 14%. The increase in risk premia considered resulted in a decline in bond prices of 0.3%–30.8% depending on the type of bond (government or corporate), its maturity, its geographical location and the issuer's rating. The results of the sensitivity analysis showed that investment funds would be hit hardest by this drop (see Chart III.16). This was due to their sizeable equity holdings, for which the biggest decrease in prices was considered in the analysis. The materialisation of the risk considered at the end of 2018 would have had a slightly smaller impact than the possible materialisation of this risk in previous years. This was because the riskiness of portfolios had not increased further and the relatively safe buffer of bank deposits had grown (see Chart III.15). The maturity structure of bonds in portfolios was also favourable as regards portfolio riskiness, as the average maturity of both government and corporate bonds declined slightly in 2016–2018, resulting in lower sensitivity of bond portfolios to an interest rate shock (see Chart III.3 CB).

Equity and bond market corrections in recent years have not resulted in an outflow of investors

The recent experience with market corrections does not so far indicate that households are significantly sensitive to financial market developments. A decline in prices of Czech government bonds due to monetary policy tightening at the end of 2017 caused pension funds to incur market losses. Similarly, corrections on equity markets in December 2018 caused an absolute quarter-on-quarter decrease in the value of investment funds' assets. However, this did not lead to a decline in investors' interest in shares in these funds (see Chart III.17). Nevertheless, this experience does not rule out the possibility of investors changing their behaviour in the event of a major correction or a sustained decline on financial markets. This is also evidenced by historical experience in the second half of 2008, when a simultaneous decline in financial asset prices and an exodus of investors led to a 29% decrease in the total assets of the domestic collective investment funds segment (see Chart III.4 CB). The CNB is therefore continuing to monitor the systemic risk associated with the non-bank financial system and is involved in the international debate about potential macroprudential instruments beyond banking (see FSR 2017/2018, section 5.4.5).

49 This risk is highest for shares in investment funds. For pension and insurance investment products, the incentive to terminate investment products is lower, due mainly to a loss of tax discounts. Nevertheless, in the event of financial need coupled with uncertainty about the stability of investment product providers, there is risk of increased interest in terminating contracts relating to pension and insurance products.

50 The sensitivity analysis did not account for hedging. In the case of insurance companies, it covered all financial placements regardless of whether the investment risk is borne by the policy holder or the insurance company. It did not consider any change in the prices of financial assets not traded on financial markets. The effect of exchange rate risk was not considered either.

3.3.1 Insurance Companies

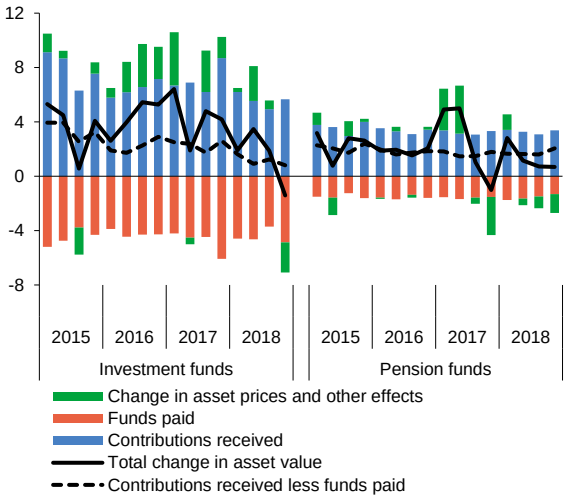
Insurance companies as a whole remained sufficiently capitalised…

Insurance companies' assets recorded a slight year-on-year increase of CZK 8 billion (1.6%) to CZK 520 billion. The aggregate ratio of eligible own funds of insurance companies[51] to the solvency capital requirement (SCR) was 227% at the end of 2018 (down by 8 pp year on year). Most insurance companies maintained eligible own funds well above the SCR (see Chart III.18). The ratio of eligible own funds to the SCR at the end of 2018 was partly affected by developments on global financial markets, which saw an increase in risk premia and a decline in expectations about the speed of future growth in monetary policy rates. These developments (a "double hit" shock) were unfavourable for insurance companies, as slower growth in monetary policy rates led to a fall in long-term risk-free interest rates and hence a rise in the aggregate value of insurance companies' liabilities,[52] while growth in risk premia conversely resulted in a decline in the prices of financial assets held by insurance companies. The worse global macroeconomic outlook and growing uncertainty on financial markets mean there is a risk of this adverse situation continuing (see section 2.1). The CNB is therefore continuing to monitor the value of assets and liabilities and capitalisation of insurance companies and is using supervisory stress tests and the new macro-stress test to verify the resilience of the insurance sector (see section 4.1.2). The most recent test results showed that the domestic insurance sector as a whole would be sufficiently capitalised even in the event of a major "double hit" shock.[53]

Chart III.17

Decomposition of the change in the value of assets of investment and pension funds

(% of total assets of segments)

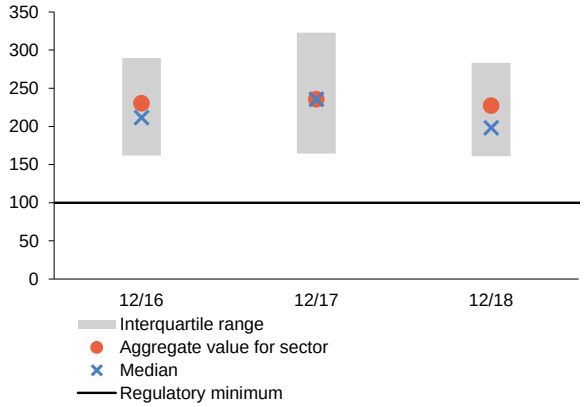


Source: CNB
Note: The values are gross contributions received and funds paid, i.e. unadjusted for the transfer of funds between funds.

Chart III.18

Ratio of insurance companies' eligible own funds to the solvency capital requirement

(%)



Source: CNB
Note: Branches of foreign insurance companies and the Export Guarantee and Insurance Corporation are excluded from the calculation.

51 Excluding branches of foreign insurance companies and the state export insurance company EGAP, whose solvency position is different from the rest of the insurance sector due to state guarantees.
52 Under Solvency II, insurance companies calculate the value of liabilities by discounting future expected cash flows. Risk-free yield rates derived mostly from interest rate swaps, whose values are closely linked to current and expected future monetary policy rates, are used for discounting.
53 Detailed results of the supervisory stress tests of insurance companies are published on the CNB website: https://www.cnb.cz/en/financial-stability/stress-testing/.

…and growth in assets and profitability reflected dynamic growth in non-life insurance

Sufficient capitalisation continued to be fostered by the sector's profitability. The aggregate rate of return on the sector's assets increased by 63 bp year on year to 2.84% (see Chart III.5 CB). The increase in profitability and total growth of the insurance sector as measured by premiums written in 2018 was due to non-life insurance, which recorded a year-on-year rise in gross premiums written of 6% to CZK 101 billion, while claim settlement costs remained unchanged year on year (see Chart III.6 CB). Conversely, the importance of life insurance as a whole continued to decrease (premiums written fell by 3% year on year to CZK 54 billion), as clients' and insurance companies' interest in insurance products with an investment component continued to decline.

3.3.2 Pension Management Companies

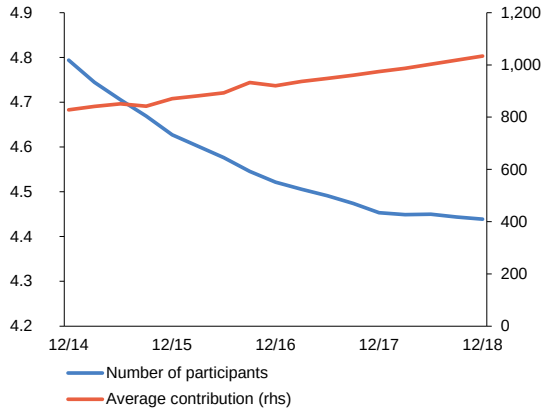
The assets administered by pension management companies (PMCs) are rising constantly, but PMCs' role in providing for retirement remains limited

The total assets administered by PMCs' funds ("pension funds") grew by CZK 25 billion year on year (5.6%) to CZK 470 billion as of December 2018. This growth was due to higher contributions received than sums paid out (see Chart III.17). In 2018, the long-running decline in participants halted and the upward trend in the share of participants with employer contributions and in the average size of contributions continued (see Chart III.19). Average contributions remain relatively low[54] and fell year on year (to 4.3%) due to high wage growth relative to the net wage. A large majority of participants (over 95% at the end of 2018) prefer lump-sum settlements to regular pension payments. Pillar 3 thus remains a complementary investment product whose returns for participants are enhanced by state support and tax deductible employers' contributions.

Chart III.19

Number of participants and the average contribution in the third pension pillar

(millions; right-hand scale: CZK/month)

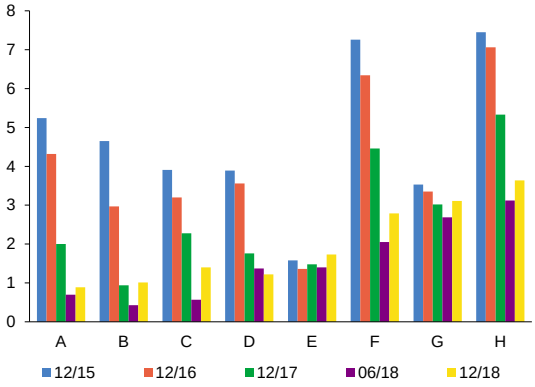


Source: CNB
Note: The number of participants includes those in transformed and participation funds. Contributions consist of those by the participant, the employer and the state. The contributions are averaged over the last four quarters and are relative to the average number of participants for those quarters.

Chart III.20

Combined capital surplus of pension management companies

(% of TFs' total assets)



Source: CNB
Note: The letters denote individual pension management companies. The combined capital surplus is the sum of the capital surplus (i.e. the difference between capital and the capital requirement) of PMCs and the "capital" (i.e. the difference between assets and liabilities) of TFs. A positive value can be interpreted as the percentage size of the shock to the assets of TFs which would lead to a fall in the capital of PMCs to the capital requirement level.

54 Including state support, they amounted to just CZK 1,034 per month in 2018.

Financial market developments were unfavourable for PMCs

The evolution of asset prices was unfavourable for transformed and mandatory conservative funds, which hold a large part of their portfolios in Czech government bonds, and for other participation funds, which have a more risky asset structure. Market revaluation reduced the total value of pension funds' assets by CZK 7.5 billion. Four transformed funds saw their assets fall below their liabilities. As the law forbids the transfer of market losses to participants, this difference had to be made up by PMCs from their own funds. In one case, this led to a drop in capital below the regulatory minimum and the company had to top up its capital.

The size of transformed funds is a persisting source of vulnerability for PMCs

In its Financial Stability Reports, the CNB regularly points out sources of vulnerability of PMCs. An appropriate measure of PMCs' resilience to the risks of transformed funds (TFs) is the concept of the combined capital surplus, consisting of PMCs' capital surplus (the difference between PMCs' capital and capital requirements) and the "capital" administered by TFs (the difference between TFs' total assets and liabilities). It indicates that despite some improvement in the second half of 2018, the resilience of PMCs decreased year on year (see Chart III.20). Given the size of TFs' assets, a downturn in market prices could lead to large top-ups and cause PMCs problems in meeting the capital requirements. Owners of four companies would have to top up capital if TFs' assets were to fall by less than 1.5%. The CNB is monitoring the situation and is engaged in an intense dialogue with the endangered companies about their capital planning.

3.3.3 Investment Funds

Investment funds can contribute to systemic risk by multiplying falls in asset prices…

Investment funds' assets grew by CZK 24 billion (5.0%) year on year to CZK 507 billion. Any drop in the value of investment fund units and growth in market volatility may cause investors to make more redemption requests. In order to be able to meet these requests, investment funds must have sufficient liquid assets. If they were unable to cover the outflows from liquid reserves, they would have to sell less liquid assets, which could further contribute to the fall in asset prices, initiating a spiral of price falls, investor exoduses and fire sales.[55] This spiral could be exacerbated if investment funds were credit financed.

… the systemic risk stemming from the domestic investment fund segment has not increased

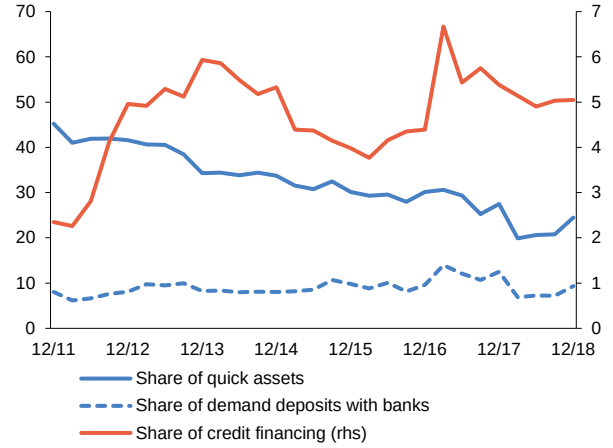
Domestic investment funds' share of credit financing remained low at 5% at the end of 2018 (see Chart III.21). On the other hand, their liquid assets dropped further, the year-on-year decrease of 3 pp to 24.5% being due mainly to a decrease in bank deposits. The long-running downward trend in the share of liquid assets in recent years is linked with dynamic growth of the segment of investment funds, which made new investments mainly in shares. The relative share of government bonds thus decreased, although the absolute volume of government bonds held by domestic investment funds was little changed. As the majority of investment fund assets were invested on highly liquid foreign markets (see Chart III.15), the risk of a negative spiral of fire sales and investor outflows remained low. Nevertheless, if uncertainty were to rise, investment funds could contribute to the multiplication of risks on the domestic real estate or government bond markets.

55 Government bonds of countries with low credit risk can serve as safe assets and can therefore be expected to be in high demand even at times of market uncertainty. Hence, they are considered here to be liquid assets. In contrast, equity or real estate investments, for example, can be strongly affected by uncertainty. The reduced liquidity reflects growth in the costs associated with selling such assets rather than them being unsellable, as bid-ask spreads rise and prices fall at times of market uncertainty.

Chart III.21

Investment funds' share of liquid assets and credit financing

(% of assets)

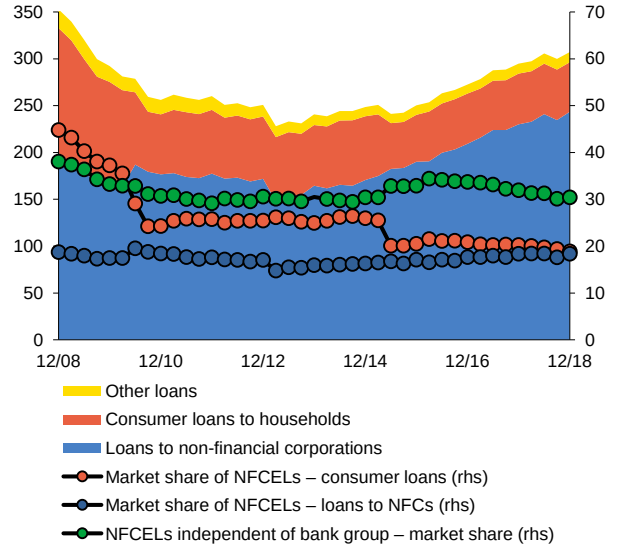


Source: CNB
Note: Quick assets comprise cash, claims payable on demand (including bank deposits) and government bonds. The share of quick assets relates to collective investment funds while the share of credit financing relates to all investment funds.

Chart III.22

Loans provided by non-bank financial corporations engaged in lending

(stock of loans in CZK billions; right-hand scale in %)



Source: CNB
Note: Market share of NFCELs in total loans provided to residents by banks and NFCELs combined. The market share of independent NFCELs relates solely to loans to residents provided by all NFCELs.

3.3.4 Non-bank Financial Corporations Engaged in Lending

The trends in the market shares and loan riskiness of non-bank financial corporations are mixed

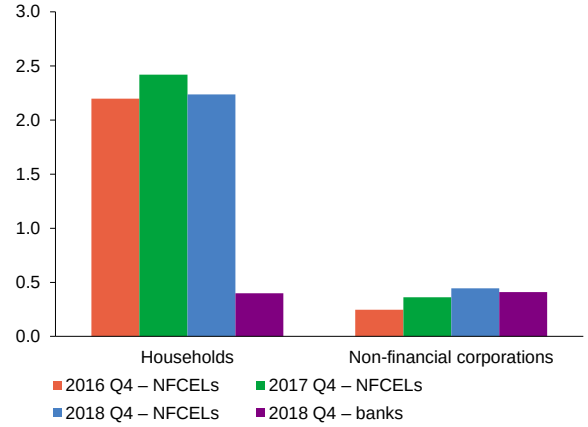
The total volume of loans provided by non-bank financial corporations engaged in lending (NFCELs) continued to grow (by CZK 12.3 billion year on year to CZK 307.2 billion), although less quickly than in past years (see Chart III.22). The average year-on-year growth fell from 8.1% in 2016 and 2017 to 5.3% in 2018. As in previous years, the year-on-year growth in loans provided by NFCELs was largely due to loans to non-financial corporations (5.8% growth), whereas loans for consumption dropped slightly (by 2%). The trends in the market shares and loan riskiness of NFCELs are mixed across segments. The market share of NFCELs in loans to non-financial corporations was flat after several years of growth, while the downward trend in loans to households (typically loans for consumption) continued. The decline in loans to households may be linked with the completion by the CNB of the non-bank consumer credit provider licensing process under the Consumer Credit Act, which is a significant step towards establishing a transparent market environment for consumer credit and improving management of the related credit risks.[56] Loan riskiness, as expressed by the three-month default rate, decreased by 18 bp to 2.24% for NFCEL loans to households, whereas that for NFCEL loans to non-financial corporations continued to follow a slight upward trend (see Chart III.23). Nevertheless, the longer-term conclusion regarding the riskiness of NFCEL loans compared with bank loans holds: NFCEL loans to households exhibit a higher degree of credit risk, whereas for loans to non-financial corporations broadly similar figures are observed in both segments of the financial sector, as secured leasing loans make up the bulk (85%) of NFCEL loans to non-financial corporations.

56 During 2018, the CNB granted licences to 87 applicants and processed applications from other companies. After issuing licences, it commenced supervisory and inspection work involving off-site thematic investigations and standard on-site inspections in supervised entities.

Chart III.23

3M default rate on loans provided by NFCELs and banks

(%)



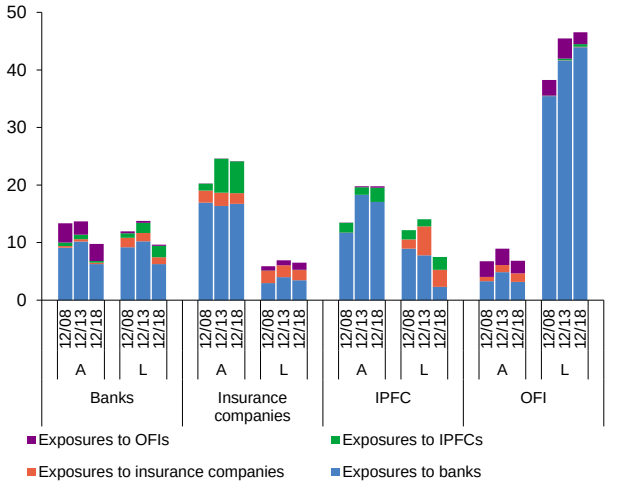
Source: CBCB, CNCB, SOLUS, CNB

Note: The default rate on loans provided to households by NFCELs is calculated as the average of the data from the NRCI and SOLUS. Only the NRCI is used for non-bank loans to non-financial corporations. Loans for consumption in the case of households.

Chart III.24

Share of exposures to domestic financial counterparties

(% of financial assets and liabilities of segments)



Source: CNB

Note: A = assets, P = liabilities. IPFCs = investment and pension funds and companies The segment of other financial intermediaries (OFIs) primarily comprises NFCELs and non-bank security dealers. Year-end values.

3.4 INTERCONNECTEDNESS OF THE FINANCIAL SYSTEM

The level of direct balance-sheet interconnectedness in the domestic financial sector has not increased

Domestic banks continued to represent the main component of the interconnectedness of the segments of the domestic financial sector. Bank deposits remained a substantial liquid asset in the balance sheets of insurance companies and investment and pension funds in 2018. These institutions also had significant mortgage bond exposures to banks (see Chart III.24). Activity on the domestic interbank market fell by CZK 16 billion year on year and the average value of the mutual exposures of domestic banks in the form of deposits, bonds and loans reached CZK 429 billion (the average for the individual quarters) in 2018. On the asset side, banks were the key source of financing for domestic financial groups and were important for the financing of other financial intermediaries (OFIs, mostly NFCELs), to whom they had provided almost 50% of financing as of the end of 2018. The largest component of balance-sheet interconnectedness outside the banking sector was shares held by insurance companies in domestic investment funds, which represented a natural way of allocating part of the investment portfolios of insurance companies. The continued relatively low level of interconnectedness indicates that the structural component of systemic risk is stable and the risk of contagion across the segments of the domestic financial market in the event of a negative shock is not increasing.

Czech government bonds remain the main component of indirect interconnectedness

Financial market segments are also connected indirectly through joint exposures. A negative shock impacting one of the segments may motivate the entities affected to sell off financial assets, for example in order to satisfy liquidity needs or reduce the capital requirement. If the sell-off concerns financial assets representing joint exposures, the drop in their prices will affect other segments. In the domestic financial market, the joint exposures consisted mainly of Czech government bonds (see Chart III.15). The potential impact of changes in their prices on the profits of domestic financial corporations became partially apparent in 2017–2018, when a rise in Czech government bond yields reflecting monetary policy tightening and a related fall in prices led to losses in the pension fund segment. As this development was gradual and expected, it did not lead to a negative spiral of fire sales. Nevertheless, a sudden repricing of Czech government bonds combined with an increase in risk premia and a significant outflow of foreign investors could lead to contagion and multiplication of the initial price drop. The CNB thus continues to consider the risk of a sharp repricing of risk premia to be a significant risk to financial stability.

Banks remain in a net creditor position in their ownership groups…

The upward trend in the creditor position of the five largest domestic banks in their groups was interrupted in 2018 (see Chart III.25). Their net claim on controlled entities rose by CZK 1.3 billion to CZK 121.1 billion year on year, but owing to a larger rise in the volume of capital the net creditor position fell by 1.3 pp to 35.7% of the total regulatory capital of domestic banks. On banks' asset side, claims on own NFCELs rose (by CZK 19.4 billion). NFCELs remain the largest debtor within bank groups (78.1% of all claims). Nevertheless, the high concentration of claims on NFCELs has long been stable and, given the nature of the controlled companies' transactions (leasing and factoring), does not give rise to increased risk. Liquidity from building societies also increased year on year (by CZK 9 billion). As in past years, this item represents the largest part of banks' liabilities within their groups (76%). Its year-on-year rise may be linked with a change in intra-group liquidity strategies due to the growth in monetary policy rates.

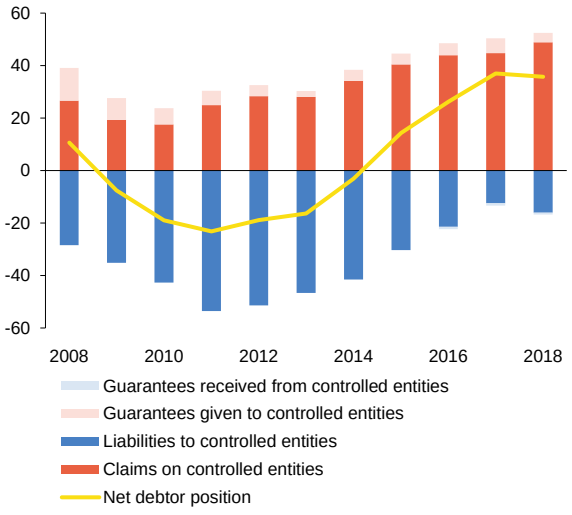
…but the upward trend in the net debtor position of banks vis-à-vis non-residents was interrupted

The domestic banking sector's total international debtor position fell by CZK 3.7 billion year on year to CZK 1,078 billion (see Chart III.26). By contrast, the net debtor position of the five largest domestic banks vis-à-vis foreign parent financial institutions continued its trend of previous years, growing by 32 pp year on year to 236% of these banks' regulatory capital. Whereas the developments in 2017 had been due to a sizeable rise in non-residents' deposits connected with the expected exit from the exchange rate commitment, the further growth in the international net debtor position of a large part of the banking sector can be attributed to the growth in monetary policy rates, which increased interest profit on exposures to the CNB (see Chart III.10).

Chart III.25

Interconnectedness in domestic bank groups

(% of regulatory capital of domestic parent banks)



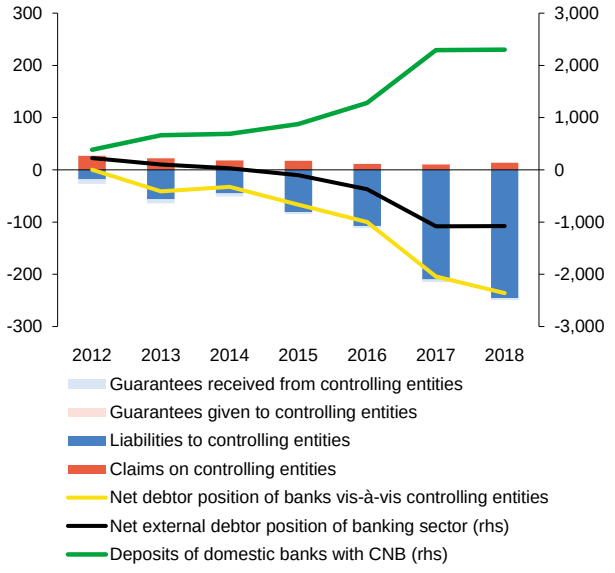
Source: Obligatory information to be disclosed pursuant to Decree No. 123/2007 and Decree No. 163/2014

Note: The chart depicts the aggregate credit interconnectedness of the largest domestic banks, i.e. Česká spořitelna, ČSOB (except Hypoteční banka), Komerční banka and Raiffeisenbank. UniCredit Bank is included only in the periods when it controlled entities.

Chart III.26

Interconnectedness vis-à-vis non-residents

(% of regulatory capital of domestic banks; right-hand scale: CZK billions)



Source: Obligatory information to be disclosed pursuant to Decree No. 123/2007 and Decree No. 163/2014, banks' annual reports, CNB

Note: The chart depicts the aggregate credit interconnectedness of the five largest domestic banks vis-à-vis their parent companies. The net debt position of the banking sector represents the overall net position of all banks vis-à-vis all non-residents excluding shares and other equity.

4 STRESS TESTS

The resilience of selected sectors was tested in macro stress tests using a Baseline Scenario and an Adverse Scenario as usual (see section 2.1). In some cases, the Adverse Scenario is complemented by sensitivity analyses specific to a given sector.

The stress tests of the banking sector confirmed its capital and liquidity resilience to the Adverse Scenario. The capital surplus held voluntarily by banks contributed significantly to keeping the sector's overall capital ratio above the 8% regulatory threshold over the stress test horizon. The currently solid capitalisation coupled with a strong client deposit base and a high proportion of liquid assets also ensured banks' resilience to liquidity shocks. The results of the insurance sector stress tests confirmed that, despite a decline in the ratio of eligible capital to the solvency capital requirement to less than 100% for three insurance companies in the Adverse Scenario, this sector was not a source of systemic risk. The stress test of pension management companies pointed to a reduction in the intensity of the market risks faced by transformed funds. The resilience of transformed funds fell in 2018 owing to a decline in their excess of assets over liabilities. In the future, this may force pension management companies to cover transformed funds' investment losses even in the event of only slightly unfavourable developments. The household stress test confirmed that households with a debt service-to-income ratio of over 45% are the most vulnerable group. Furthermore, the test demonstrated households' high sensitivity to a fall in real wages and a rise in client interest rates. The CNB continues to regard credit institutions' sovereign exposures to the Czech government as systemically important. Given the favourable results of the Czech public finance stress test, however, the CNB will not require credit institutions to meet an additional capital requirement to cover the risk of concentration of these exposures over a three-year horizon.

4.1 SOLVENCY STRESS TESTS OF BANKS, INSURANCE COMPANIES AND PENSION MANAGEMENT COMPANIES

4.1.1 Solvency Macro Stress Tests of Banks

Solvency stress tests are one of the most important tools for assessing the resilience of the banking sector to potential risks to the stability of the Czech financial sector. Particular attention is paid to credit risk, which has long been the most important risk in the Czech banking sector. The evolution of credit risk is closely linked with developments in the non-financial corporations and household sectors.

The stress test methodology has been refined in the area of the response of credit risk to economic developments

The sensitivity of the satellite model for calculating the default rate to economic developments has been increased and the model provides more robust estimates for both scenarios thanks to the use of Bayesian modelling techniques. In addition, the models for estimating credit losses and provisions in connection with the IFRS 9 accounting standard have been revised and adjusted thanks to information from new statements and from the 2018 supervisory stress test.[57]

In the *Baseline Scenario* credit risks stagnate and the sector's profitability rises

The continuing economic growth is reflected in the *Baseline Scenario* in a greater ability of corporations and households to repay their debts, i.e. a lower level of credit risk (see section 2.2). The default rate – a key indicator of credit risk materialisation – remains very low in both the non-financial corporations and household sectors (see Table IV.1). Banks' interest income and profitability are being boosted by rising interest rates and the banking sector's significant exposure to the central bank.[58]

57 https://www.cnb.cz/en/financial-stability/stress-testing/supervisory-stress-test/.
58 See section 3.2.3 for details on profitability.

Table IV.1

Key variables in the individual scenarios

(averages for given years)

	Actual value	*Baseline Scenario*			*Adverse Scenario*		
	2018	2019	2020	2021	2019	2020	2021
Macroeconomic variables							
GDP (y-o-y %)	2.8	2.9	3.0	3.0	-0.7	-4.9	-1.4
Inflation (y-o-y %)	2.1	2.2	2.0	2.0	1.9	1.6	-0.3
Unemployment (%)	2.3	1.9	1.8	1.8	2.4	4.0	5.9
Nominal wage growth (y-o-y %)	7.8	6.9	5.6	5.0	2.2	-1.2	2.6
Effective GDP growth in the euro area (y-o-y %)	2.1	1.6	1.7	1.6	-0.9	-3.6	-0.9
Credit growth (%)							
Non-financial corporations	4.4	3.2	4.2	3.9	1.5	-2.7	-0.8
Loans for house purchase	8.4	5.0	5.4	5.3	2.8	-2.2	-1.1
Consumer credit	5.6	5.8	6.6	7.0	4.0	-0.5	-1.8
Default rate (PD, %)							
Non-financial corporations	1.3	1.4	1.3	1.2	3.2	4.7	4.8
Loans for house purchase	0.9	0.8	0.7	0.7	2.7	4.1	4.2
Consumer credit	4.2	4.2	4.3	4.6	8.2	9.1	8.2
Loss given default (LGD, %)							
Non-financial corporations	32	32	32	32	45	56	51
Loans for house purchase	15	15	15	15	26	37	42
Consumer credit	42	41	41	41	48	59	64
Asset markets (%)							
3M PRIBOR	1.3	2.1	2.1	2.6	0.8	0.3	0.3
5Y GB yield	1.5	1.8	2.0	2.6	1.2	1.0	1.2
3M EURIBOR	-0.3	-0.3	-0.1	0.1	-0.3	-0.3	-0.3
5Y EUR GB yield	-0.2	0.2	0.5	0.9	0.0	0.3	0.5
Change in residential property prices	8.2	6.8	4.6	3.8	-2.1	-15.0	-13.0
Change in share prices	-8.5		5.0			-35.0	

Source: CNB, BRCI

Table IV.2

Impact of the alternative scenarios on the banking sector

	Baseline Scenario			*Adverse Scenario*		
	2019	2020	2021	2019	2020	2021
Provisions for non-performing loans (credit losses)						
CZK billions	-17.0	-17.8	-18.6	-29.4	-74.9	-93.7
% of assets	-0.2	-0.2	-0.2	-0.4	-1.0	-1.3
Provisions for performing loans						
CZK billions	-0.9	-0.5	-0.6	-69.2	-20.1	9.3
% of assets	0.0	0.0	0.0	-0.9	-0.3	0.1
Profit/loss from market risks						
CZK billions	-1.3	-1.5	-2.7	3.9	-0.7	-2.0
% of assets	0.0	0.0	0.0	0.1	0.0	0.0
Earnings for covering losses (adjusted operating profit)						
CZK billions	102.9	105.7	117.0	74.5	55.4	47.8
% of assets	1.4	1.4	1.5	1.0	0.8	0.7
Pre-tax profit/loss						
CZK billions	83.7	85.9	95.0	-20.2	-41.5	-38.6
% of assets	1.1	1.1	1.2	-0.3	-0.6	-0.5
Capital ratio at end of period in %						
Total	**19.4**	**19.3**	**19.1**	**16.8**	**12.4**	**10.7**
Tier 1	**18.9**	**18.8**	**18.6**	**16.4**	**12.0**	**10.4**
Capital injections						
CZK billions		0.0			30.4	
% of GDP		0.0			0.6	
Number of banks below 8% capital ratio		0			9	

Source: CNB
Note: Losses and provisions are presented with a minus sign.

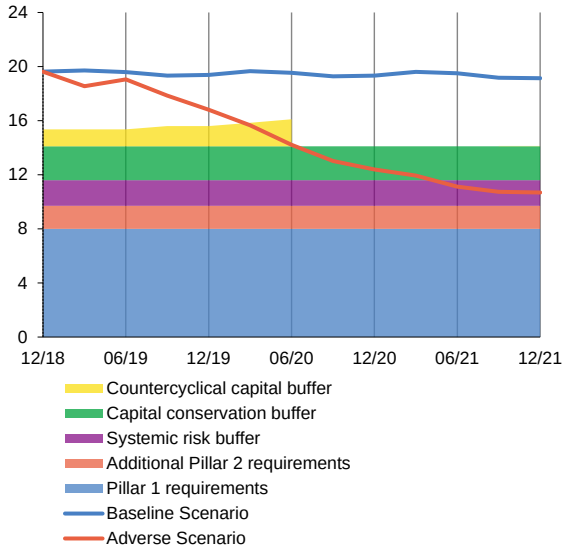
The banking sector remains very well capitalised in the *Baseline Scenario*

The banking sector remains resilient and has sufficient capital reserves (see Table IV.2). The sector's aggregate capital ratio remains almost constantly above 19% over the three-year test horizon. The Tier 1 capital ratio is only about 0.5 pp below the total capital ratio. Thanks to high profitability, no bank gets into a situation of an insufficient capital ratio in the *Baseline Scenario*, which assumes growth in credit portfolios of between 3% and 7%.

Chart IV.1

Impact of the alternative scenarios and interactions with the capital requirements of the banking sector

(pp)



Source: CNB
Note: Illustration depicts the reaction of macroprudential policy represented by the lowering or dissolving of the countercyclical capital buffer in the *Adverse scenario*.

Table IV.3

Results of the stress tests for different minimum capital settings

	Baseline Scenario		*Adverse Scenario*	
Minimum settings	Capital injections in CZK billions	Banks below minimum	Capital injections CZK billions	Banks below minimum
Pillar 1 (8%)	0.0	0	30.4	9
TSCR (Pillar 1 + additional Pillar 2 requirements)	0.0	0	48.6	11
TSCR + systemic risk buffer	0.0	0	83.7	14

Source: CNB
Note: Constant requirements in Pillar 2 and the systemic risk buffer over the entire test period are assumed for the calculation of capital injections.

The *Adverse Scenario* assumes a fall into a V-shaped recession

The *Adverse Scenario* assumes that materialisation of global risks (see section 2.1.3) leads to a sizeable drop in economic activity abroad, which in turn causes the domestic economy to contract. The domestic economy gets into a deep and long-lasting recession resulting in the exhaustion of the financial reserves of some households and non-financial corporations and debt repayment problems. This is reflected in a substantial rise in the default rate and loss given default (see Table IV.1).

The *Adverse Scenario* implies significant losses for the banking sector

The *Adverse Scenario* assumes growth in credit losses given the rising default rate and also assumes high provisioning for performing loans owing to its assumption of exact knowledge of future economic developments.[59] Credit losses start to rise in the first year of the test period from relatively low initial loss given default and default rate levels. Market risks have no significant effect on the overall result.[60] In response to economic developments, the scenario assumes a decline in monetary policy rates and a drop in lending. This leads to a decrease in yields and a gradual slide of the banking sector into loss (Table IV.2).

A falling capital ratio will be reflected in the countercyclical capital buffer rate

The model impact of the *Adverse Scenario* shows that the capital ratio of the banking sector as a whole gradually decreases, converging to the level of the capital requirements including the CCyB in the fifth quarter following the start of the test

59 The "perfect foresight" assumption Box 3.2 discusses the effect of banks' alternative economic expectations that would lead to different provisioning profiles.
60 The decline in long-term interest rates assumed in the scenario has a positive effect on banks in the first year, generating profit on market risks.

(see Chart IV.1).[61] It subsequently falls to the level of the capital requirement excluding the CCyB at the end of the sixth quarter (see Chart IV.1).[62] Under the model assumptions of the *Adverse Scenario*, it can be assumed that by this period at the latest, the CNB would make one-off or stepwise changes to the CCyB rate allowing it to be used effectively to absorb the adverse economic shock.

Some banks would need capital injections to meet the minimum capital requirement

Although the aggregate capital ratio stays sufficiently above 8% in the *Adverse Scenario* (see Chart IV.1), nine banks – representing about 13% of the sector's assets – record a fall in the capital ratio below the regulatory minimum of 8%. These banks would have to top up their capital, with the necessary capital injections totalling CZK 30.4 billion, i.e. 0.6% of GDP (see Table IV.2, second column). Relative to the size of the banking sector, this figure is not large enough to jeopardise its stability. The banking sector's stability is based on its aggregate capital ratio and on its ability to generate income to cover losses even in the event of highly adverse developments.

A rise in the minimum capital requirement increases the need for capital injections…

Taking into account the additional Pillar 2 requirements and some of the capital buffers (in this case the SRB; see FSR 2015/2016, section 4.2.4) in the assessment of compliance with the minimum capital requirement increases the thresholds for passing the stress tests. Increasing the threshold for passing the stress tests to the level of the total capital requirement (TSCR, the sum of the Pillar 1 requirements and the additional Pillar 2 requirements) does not cause a need for capital injections in the *Baseline Scenario*. In the *Adverse Scenario*, the necessary capital injections rise to CZK 48.6 billion and 11 banks would not comply with the threshold (see Table IV.3). If the threshold is raised to the sum of the total capital requirement (TSCR) and the systemic risk buffer maintained by systemically important institutions, i.e. to the level of the "other relevant capital ratio", again no need for capital injections arises in the *Baseline Scenario*. In the *Adverse Scenario*, however, the necessary capital injections increase to CZK 83.7 billion and 14 banks would not comply with the threshold (see Table IV.3).

…and significantly affects profit distribution and dividend payments

This result reflects not only the very strong shock assumed in the *Adverse Scenario*, but also the assumption of perfect foresight, as reflected in a sharp jump in provisioning for performing loans. Such a situation is very unlikely to occur. However, should a situation arise in which banks are unable to cover the applicable combined capital buffer requirement, as signalled in aggregate terms by the impact of the *Adverse Scenario* (see Chart IV.1),[63] they would be required to prepare capital restoration plans (Article 12m(4) of the Act on Banks) and submit them to the CNB. In this situation, profit distribution and dividend payments would be governed by the rules restricting the distribution of income related to Common Equity Tier 1 (CET1).[64]

The capital ratio falls in the *Adverse Scenario* mainly because of high losses and a sharp rise in risk weights

A decomposition of the change in the capital ratio clearly illustrates the impacts of the main factors. In the *Baseline Scenario* (see Chart IV.2), income increases the capital ratio by as much as 12.3 pp over the test horizon. Most of this income is used to pay dividends and taxes (-9.1 pp). It is also used to cover expected credit and market losses (-2.3 pp) and to partly cover growth in credit exposures (-2.0 pp). The capital ratio moves to a final level of 19.1% through a decrease in risk weights

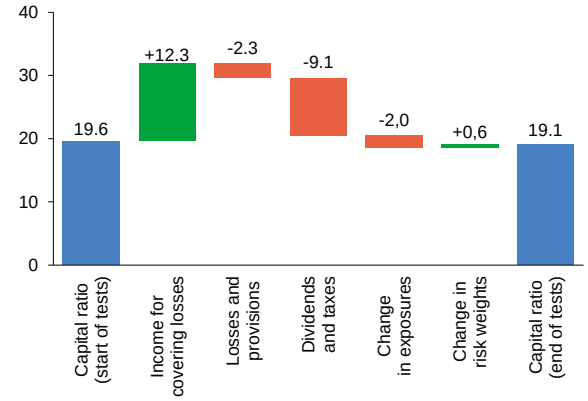
61 The point of intersection of the upper bound of the yellow band denoting the CCyB and the red line describing the path of the capital ratio in the period 03/20.
62 The point of intersection of the lower bound of the yellow band denoting the CCyB and the red line describing the path of the capital ratio in the period 06/20.
63 This situation arises at the point where the red line describing the path of the capital ratio crosses the upper bound of the green band denoting the CCoB.
64 The maximum distributable amount (MDA) is derived from the coverage of the combined capital buffer requirements with CET1 capital – see Article 141 of the CRD.

(+0.6 pp). In the *Adverse Scenario*, banks are also able to generate income to cover losses (an increase in the capital ratio of 10.6 pp). This is sufficient to cover all expected losses (-10.5 pp). Dividends and taxes paid from profits for 2018 and 2019 make a negative contribution to the capital ratio of 2.0 pp. Banks react to the worse situation by lowering the amount of loans; the change in exposures thus increases the capital ratio by 0.3 pp. The deterioration of the economic environment and the materialisation of credit risk increases the risk weights, fostering a marked drop in the banking sector's capital ratio of 7.3 pp to 10.7% at the end of the test (see Chart IV.3).

Chart IV.2

Decomposition of the change in the capital ratio of the banking sector in the *Baseline Scenario*

(%)

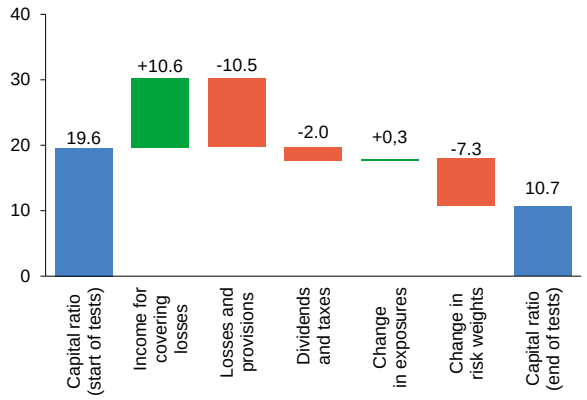


Source: CNB

Chart IV.3

Decomposition of the change in the capital ratio of the banking sector in the *Adverse Scenario*

(%)



Source: CNB

Without a capital surplus, the banking sector would fall below the regulatory minimum in the *Adverse Scenario*

At the end of the test, the aggregate capital ratio is above the regulatory minimum of 8%. However, if banks had no capital surpluses at the start of the test (at the end of 2018 they had a surplus of 4.1 pp), the capital ratio would fall below the regulatory minimum (see Chart IV.4). The stress test results thus show that a voluntary capital surplus plays an important role in ensuring banking sector stability. Its potential use to cover the minimum requirement for own funds and eligible liabilities (MREL; see section 3.2.1 and the relevant thematic article[65]) may have a significant effect on the assessment of the resilience of systemically important banks in the future.

A supplementary sensitivity analysis shows the impacts of losses arising from debtor concentration…

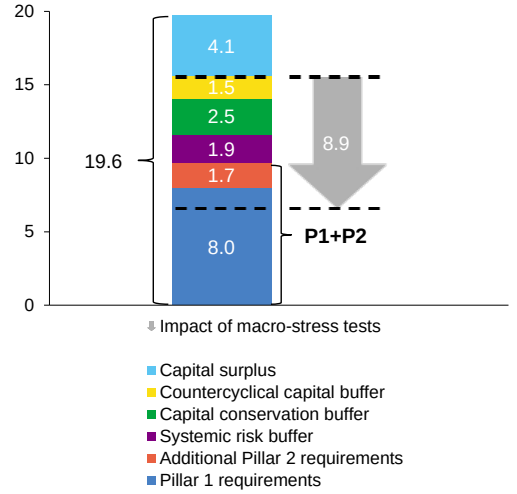
A sensitivity analysis conducted in the *Adverse Scenario*, where the default rate generally rises, tests concentration risk by assuming the additional default of the largest debtors of each bank. Although the concentration of client loan exposures (as measured by the share of the three largest exposures in the portfolio of loans to legal entities) has long been relatively constant at around 16%, the largest loans may not be sufficiently collateralised in some cases. This is evidenced by the fact that the share of uncollateralised loans in loans to the top three debtors was 74% at the end of 2018.[66] If these debtors were to default, banks' credit losses could reach high levels.

65 Kahoun, T. (2019): *Minimum Requirement for Own Funds and Eligible Liabilities (MREL): General Approach of the Czech National Bank*.
66 At the end of 2016 it stood at 50%, so it has risen markedly in the meantime.

Chart IV.4

Structure of bank capital requirements and the impact of macro stress tests on the capital ratio

(pp)

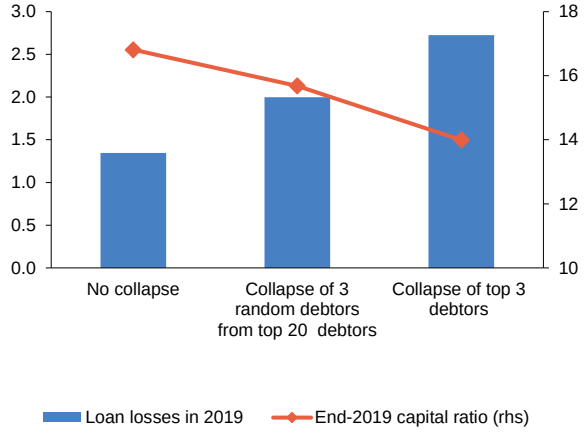


Source: CNB
Note: The illustration assumes a countercyclical capital buffer rate of 1.5%, even though it does not take effect until mid-2019. From 2020 the buffer rate will be 1.75%. From mid-2020 it will be 2.0 %.

Chart IV.5

Impact of the collapse of the top three debtors of each bank in the *Adverse Scenario*

(% of assets; right-hand scale: %)



Source: CNB

…but the banking sector is resilient to this major shock, too

The concentration test is performed in two variants.[67] The first assumes the default of three random debtors from the top 20 debtors of each bank. The other, more conservative one assumes the collapse of the top three debtors of each bank. Given the high share of uncollateralised loans in loans to the largest clients, a 50% haircut on these exposures is considered in both cases. This additional shock on top of the *Adverse Scenario* has a big effect on credit losses and the capital ratio. The capital ratio declines by 1.1 pp to 15.7% in the case of the collapse of three random large debtors, and by 2.8 pp to 14.0% in the case of the collapse of the top three debtors of each bank, at the end of 2019 (see Chart IV.5). The concentration test represents a very strong stress scenario, and the resulting banking sector capital ratio can therefore be assessed as positive in this sensitivity analysis.

4.1.2 Macro Stress Tests of Insurance Companies

The CNB newly assesses potential risks in the insurance sector using a macro stress test

The CNB has created a framework for macro stress testing the domestic insurance sector.[68] The resilience of insurance companies is tested by assessing the ratio of eligible capital to the solvency capital requirement. Insurance companies are required to maintain this ratio above 100%. The macro stress tests of insurance companies complement the supervisory stress tests of insurance companies.[69] While the supervisory tests contribute to the supervisory assessment of the risk profiles of individual insurance companies, the macro stress tests aim to assess the resilience of the sector as a whole. The macro stress tests of insurance companies follow similar principles as the supervisory tests and are based on insurance companies' balance sheets under the Solvency II legislative framework. Unlike the supervisory tests, the macro stress tests of insurance

67 Both variants involve a one-off shock to the banking sector at the end of 2019.
68 A detailed methodology for the macro stress test of insurance companies is under preparation. It is planned to be published on the CNB website at the end of 2019.
69 https://www.cnb.cz/en/financial-stability/stress-testing/insurance-sector-and-pension-management-companies-sector/.

companies evaluate the dynamic evolution of balance sheets at quarterly frequency over three years,[70] i.e. they evaluate the gradual maturing of insurance policies, the creation of new policies, repayment of debt securities held by the insurance company,[71] profitability and profit distribution under the scenarios considered. The dynamic approach enables these tests to be used to assess the potential build-up of adverse shocks over several years.

The resilience of the insurance sector is assessed under both the *Baseline Scenario* and the *Adverse Scenario*

Both the *Baseline Scenario* and the *Adverse Scenario* are fundamental to the macro stress test of insurance companies (see section 2.1.3 and Table IV.1), specifically in three areas – interest rates,[72] asset prices on financial markets and specific insurance risks. In the *Baseline Scenario*, the risk-free rates increase owing to a rise in the CNB's monetary policy rate (see Chart II.17F). Interest rates are followed by yields on corporate and government bonds, leading to a fall in their prices. In the *Adverse Scenario*, by contrast, a decline in monetary policy rates and risk-free yields and a rise in the risk spread are considered. The final impact of the *Adverse Scenario* on prices of government and corporate bonds depends on their rating. The *Baseline Scenario* does not consider any change in share prices or dividend income, while the *Adverse Scenario* expects a decline in share prices (most significantly in the first year of the test, when they drop by 31%) and dividend income. The scenarios also make assumptions about the amount of premiums, claim settlement costs and other costs, the volume of new policies and the lapse rate for life insurance policies. The scenarios for the volumes of premiums, new policies and costs in non-life insurance were set in relation to the cyclical nature of each segment.[73] The additional annual lapse rate in life insurance beyond lapses expected by the insurance company was set at 10% in the *Adverse Scenario*.[74] This reflects financial stress causing some households to cancel their life insurance policies to raise additional funds. Both scenarios assume that dividend policy will remain similar to 2016–2018. The test does not consider any change in the solvency capital requirement relative to the level at the start of the test. The requirement would tend to fall with decreasing balance-sheet size, leading to slightly better test results. However, the risk factors identified would remain unchanged. For simplicity, the test abstracts from change in the exchange rate this year, as the results of the supervisory stress tests and the size of the capital requirement for exchange rate risk suggest that insurance companies are hedged against exchange rate movements to a large extent.

According to the test results, the insurance sector as a whole should be resilient over the three-year horizon…

The stress test covers domestic insurance companies active as of 31 December 2018, representing 88% of the life insurance market and 95% of the non-life insurance market.[75] After the application of the *Baseline Scenario*, the ratio of eligible capital

70 For simplicity, the test assumes that the nature of activity remains unchanged over the test period. Likewise, it abstracts from any future mergers and acquisitions in the insurance sector.

71 For simplicity, the test does not assume reinvestment of excess liquidity. If reinvestment was considered, some insurers' liquidity positions could worsen slightly depending on the manner of reinvestment, in particular the maturity and liquidity of the financial instruments purchased.

72 Insurance companies use risk-free yield curves to discount future cash flows arising from insurance policies and determine the market value of their liabilities. An upward shift of the yield curve increases the discount factor, reducing the value of positive liabilities and hence favourably affecting the capital position of insurance companies. Insurance companies' technical provisions may even be negative, in which case a rise in yields would worsen their capital position. An upward shift of the yield curve also pushes down prices of bonds held by insurance companies. The final impact of interest rate movements on the capital position of insurance companies thus depends on the matching of future cash flows from assets and liabilities. When discounting future cash flows, insurance companies may apply volatility adjustment, which is designed to reduce the impact of financial market volatility on their capital position. The potential application of volatility adjustment was taken into account in the test.

73 The evolution of claim settlement costs in non-life insurance was in line with that of premiums received. In the *Adverse Scenario*, claim settlement costs in non-life insurance were subject to an additional upward expert adjustment of 2%–8% a year. This increase represented a general shock to the claim rate considered in the *Adverse Scenario*. A higher rate of growth of claim settlement costs was assigned to segments where growth in claim settlement costs is associated with an economic deterioration (e.g. income protection insurance, credit and guarantee insurance, legal protection insurance and financial loss insurance). The test does not assume any increased incidence of natural disasters.

74 In non-life insurance, the impact of lapses was not considered, as policies are usually concluded on an annual basis. In this case, the lapses was replaced by lower demand for insurance in procyclical insurance segments in the *Adverse Scenario*.

75 As measured by the share in net premiums written in 2018 (26 domestic insurance companies excluding branches of foreign insurance companies).

to the solvency capital requirement rose by 3 pp to 230% at the end of the third year of the test. In the *Adverse Scenario*, the ratio fell by 18 pp to 209%. Even in this case, the ratio remained sufficiently high above the regulatory threshold of 100% (see Table IV.4 and Chart IV.6).[76] Asset repricing during the first year was the main reason for the decline in eligible capital in the *Adverse Scenario*. Technical provisions in life insurance decreased gradually over the course of both scenarios. This reflected a continued fall in demand for life insurance with a saving component considered in both scenarios, with maturing or prematurely terminated policies not fully being replaced by new ones. In the *Adverse Scenario*, however, the fall in total technical provisions was slowed by a downward shift of the risk-free yield curves. This led to upward repricing of the aggregate value of unterminated liabilities and fostered a worse aggregate solvency position of insurance companies.

Table IV.4

Results of the stress test of insurance companies

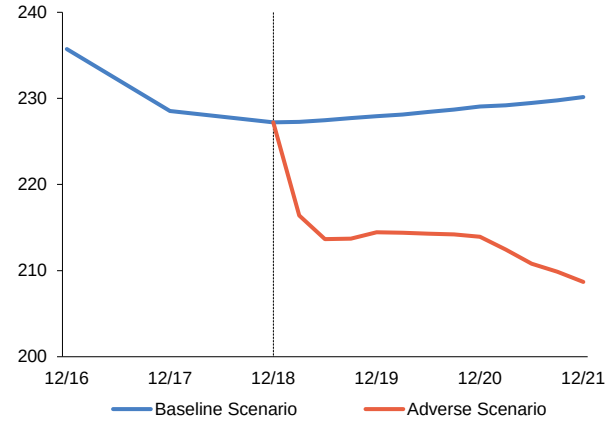
(CZK billions; year-end values, profit for whole year)

	Actual value	*Baseline Scenario*			*Adverse Scenario*		
	2018	2019	2020	2021	2019	2020	2021
Total assets	451	420	407	397	394	365	341
Investment except ULI	296	270	258	250	256	232	214
ULI assets	71	65	64	62	54	48	43
Total liabilities	319	294	282	271	283	252	233
Non-life insurance TPs	44	46	49	52	43	42	41
LI TPs except ULI	116	96	86	77	100	84	75
ULI TPs	55	48	43	38	36	22	13
Total profit	13	11	9	9	-5	3	0
Investments except ULI		5	3	1	-3	1	-3
LI TPs except ULI		2	1	2	-5	-2	0
ULI (assets and TPs)		1	1	1	1	4	4
Non-life insurance		5	6	7	3	1	-1
Tax on profit		-3	-2	-2	-1	-1	-1
Excess of assets over liabilities	132	126	125	126	111	112	109
SCR	51	51	51	51	51	51	51
Eligible capital	116	117	117	118	110	110	107
Ratio of eligible capital to SCR (%)	227	228	229	230	214	214	209

Source: CNB
Note: LI = life insurance, ULI = index-linked and unit-linked life insurance. TPs = technical provisions. SCR = solvency capital requirement. Profit on ULI investments and assets includes repricing effects and dividends received.

Chart IV.6

Ratio of eligible capital to the solvency capital requirement



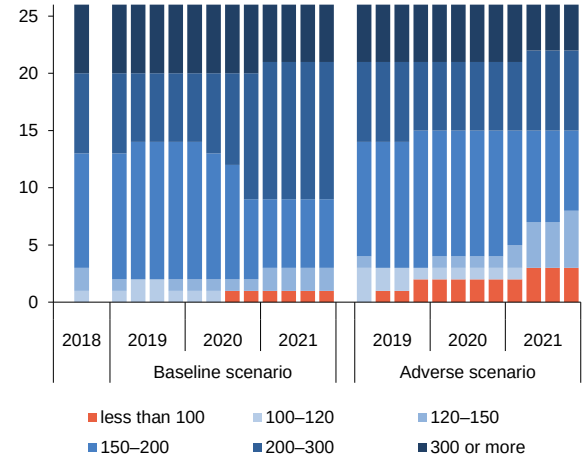
Source: CNB

… but eligible capital fell below the capital requirement in three insurance companies

The impact of the shocks considered in the *Adverse Scenario* on the capitalisation of individual insurance companies reflected differences in the composition of their investment portfolios and in their focus on individual insurance segments. In three of the insurance companies tested, the ratio of eligible capital to the solvency capital requirement fell below 100% (see Chart IV.7). However, the capital shortfall would be relatively small (CZK 614 million at the end of 2021). One of these insurance companies would not have sufficient eligible capital even in the *Baseline Scenario* (a capital shortfall of CZK 44 million).

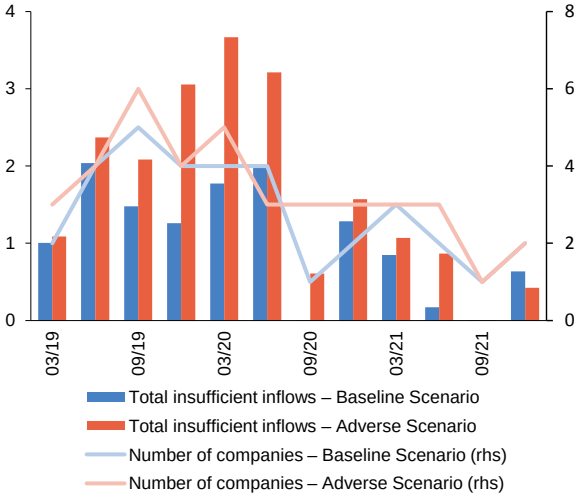
76 The macro stress test results are more favourable than the 2018 supervisory stress test results for insurance companies. This partly reflects the different scope of the risks tested and the different size of the shocks. Another reason is a different time frame. The supervisory stress test considers a one-off marked repricing of insurance companies' balance sheets. The macro stress test considers a dynamic balance sheet, so profit generated during the test on some policies or portfolios counteracts the adverse impact of the shocks even in the *Adverse Scenario*.

Chart IV.7
Insurance companies by ratio of eligible capital to the solvency capital requirement
(numbers)



Source: CNB

Chart IV.8
Matching of insurance companies' cash inflows and outflows
(CZK billions; right-hand scale: number of companies)



Source: CNB
Note: The volume of insufficient inflows is the total difference between cash inflows and cash outflows for insurance companies whose outflows outweighed inflows in the given quarter.

Potential sell-offs of domestic financial assets by insurance companies could adversely affect other institutional investors…

A continued decline in returns on insurance products with a saving component (see section 3.3) and the gradual maturing of policies for these products could result in a gradual decrease in the amount of assets covering life insurance technical provisions. If cash flows from assets and liabilities are matched, insurance companies can use the money generated by their investments to cover life insurance claims. If households started terminating policies prematurely, the natural cash flows from the investment portfolio might not be sufficient and insurance companies would be forced to sell their investment assets. On a less liquid market, sell-offs of domestic assets (especially domestic government bonds) could cause their prices to fall and exacerbate the adverse financial conditions (see section 3.4).

…but the liquidity position of insurance companies remained good even in the *Adverse Scenario* and does not give rise to a need for significant asset sell-offs

Using the macro stress test, the CNB tests whether cash inflows (bond repayments, dividends received and other investment income, and premiums received) and cash outflows (claim settlement costs and other costs, dividends and taxes) are matched, as an excess of outflows over inflows requires insurance companies to draw on their liquidity buffers and potentially sell off their assets. The test results showed that in the domestic insurance sector as a whole, insurance companies would be able to cover cash outflows even in the case of the 10% annual lapse rate in life insurance considered in the *Adverse Scenario*. At the level of individual insurance companies, however, six insurance companies would have insufficient natural flows from investments for a part of the test period in both the *Baseline Scenario* and the *Adverse Scenario*. The total amount of assets sold off to raise additional funds would fluctuate from quarter to quarter, peaking at CZK 2 billion in the *Baseline Scenario* and CZK 3.7 billion in the *Adverse Scenario* (see Chart IV.8). The total volume of assets sold would be CZK 12.5 billion and CZK 20.0 billion respectively. This would not be a source of stress on domestic financial markets. However, asset sell-offs by insurance companies at a time of market uncertainty could contribute, in a way, to amplifying an adverse shock.

4.1.3 Stress tests of pension management companies

The stress tests of pension management companies assess the sector's resilience at the one-year horizon

The stress tests of pension management companies (PMCs) focus on assessing the risks to transformed funds (TFs) managed by PMCs at the one-year horizon.[77] Besides the *Baseline Scenario*, the sector's resilience to the *Adverse Scenario* was also tested; this variant captures adverse economic developments coupled with a drop in asset prices in financial markets (see section 2.1.3 and Table IV.1).

The PMC stress-testing methodology underwent further changes…

In this year's round, the stress test methodology saw a number of changes reflecting, among other things, comments made by the PMCs tested.[78] First, the look-through approach is now applied partially to TFs' investments in mutual funds. This means that a smaller haircut is applied to units of funds investing in safer assets than to units of funds investing primarily in equity. In last year's test, all units were subject to the same haircut as that for equity. However, this change has a relatively small impact, because, as regards mutual funds, TFs invest mostly in equity funds. Second, the shock to corporate bonds is no longer the sum of the shock to corporate bonds and the shock to government bonds of the issuer's country but is modelled independently of government securities. Third, the shock to government securities is applied to corporate securities underwritten by the government (typically issued by the CEB and the EIB) in order to take into account actual credit risk. Fee for the management of transformed and participation funds was credited to PMCs in an additional sensitivity analysis.[79]

Transformed funds are mainly sensitive to interest rate risk…

The effect of the risks considered on TFs' results is summarised in Table IV.5, Chart IV.9 and Chart IV.10. As TFs mostly invest in high-quality government bonds, general interest rate risk and credit spread risk for government bonds have the most significant effect. A rise in swap curves leads to a decline in total assets of 0.3% in the *Baseline Scenario*, whereas a movement in swap rates (mainly a decrease at the short end of the koruna curve) in the *Adverse Scenario* causes the value of assets to increase by 0.9% (see Chart II. 17F). The credit spread remained broadly unchanged in the *Baseline Scenario*. A widening of the credit spread for government and corporate bonds in the *Adverse Scenario* reduced the value of total assets (by 1.3% and 0.8% respectively). TFs holding a large proportion of their assets in fixed-rate koruna bonds with longer durations are again hit hardest by the materialisation of credit spread risk. TFs reduce the impact of a potential interest rate shock by holding bonds to maturity[80] (38% of the bond portfolio is valued at amortised cost)[81] and investing in floating-rate bonds (a further 24% of the bond portfolio).[82] By contrast, the impact of the interest rate shock is reduced only slightly by derivative hedging, especially in the case of koruna assets.

In the *Adverse Scenario*, the capital adequacy of some PMCs would fall below the required minimum

PMCs guarantee non-negative returns for the clients of their TFs by law. If a TF's assets decline below its liabilities, the relevant PMC is obliged to top up the TF's assets. This is the case for five PMCs in the *Baseline Scenario*. As a result of topping up TFs' assets by a total of CZK 0.8 billion, the capital adequacy of no PMC would fall below the required

77 Participation funds were not tested, as their market losses affect the funds' clients and not PMCs. Moreover, they account for 9.5% of the sector's total assets.

78 The current version of the methodology is available at https://www.cnb.cz/export/sites/cnb/en/financial-stability/.galleries/stress_testing/download/stress_testing_FPS_methodology.pdf

79 Adding PMCs' remuneration for the management of assets in the transformed fund and participation funds in the maximum amount allowed by law reduced the number of PMCs needing capital injections in the *Adverse Scenario* to one and the size of the capital injection to CZK 0.3 billion.

80 In the case of market repricing of all bonds regardless of their accounting classification, in the *Adverse Scenario* total assets would fall by a further 0.8% and the size of the capital injection by PMC owners would rise by CZK 2.0 billion. Market repricing of the portfolio held to maturity would also lead to a need for a capital injection totalling CZK 0.1 billion in two PMCs even in the Baseline Scenario.

81 The law allows TFs to include high-quality government bonds of up to 35% of total assets in the portfolio classified as held to maturity, which is valued at amortised cost. This portfolio accounted for 30.4% of TFs' total assets in December 2018.

82 Floating-rate bonds held to maturity are not included in this 24%.

statutory level. Seven of the eight PMCs had to top up TFs' assets by a total of CZK 3.4 billion in the *Adverse Scenario*. This top-up caused the capital adequacy of three PMCs to fall below the required level, leading to negative capital in one of them. The PMC owners would have to inject capital of CZK 0.9 billion in order for their PMCs to satisfy the capital adequacy requirement.

The impacts of the scenarios on PMCs decreased year on year…

The impacts of the *Baseline Scenario* and the *Adverse Scenario* on PMCs were lower in this year's test than in last year's. This was due mainly to smaller shocks to Czech government securities, which resulted from the fact that monetary policy rate increases and changes on international markets last year led to growth in government bond yields (see section 2.1) and hence to a partial correction in their prices. The room for further potential growth in government bond yields, or a decline in government bond prices, therefore decreased. A revision of market expectations regarding future increases in the monetary policy rates of the CNB and foreign central banks (see section 2.1) also indicates a lower probability of sharp growth in yield curves, especially at their long end. In addition, TFs are able to achieve higher returns on newly purchased bonds in an environment of higher yields. Both scenarios are thus less severe for TFs, so the value of their assets declined by 2.3 pp less in this year's stress scenario than in last year's (see Table IV.6). This difference can be broken down into the effect of the scenario (1.4 pp), the effect of the change in portfolio composition (0.7 pp) and the effect of methodological changes in stress testing (0.2 pp).

Table IV.5

Results of the stress tests of PMCs

		Baseline Scenario	*Adverse Scenario*
PMC equity (start of test)	CZK billions	9.3	9.3
Capital ratio (start of test)	%	153.8	153.8
Change in TF asset value - general interest rate risk	CZK billions	-1.2	3.7
	% of TF assets	-0.3	0.9
Change in TF asset value - credit spread risk for corporate securities	CZK billions	-0.5	-3.2
	% of TF assets	-0.1	-0.8
Change in TF asset value - credit spread risk for government securities	CZK billions	-0.1	-5.7
	% of TF assets	0.0	-1.3
Change in TF asset value - exchange rate risk	CZK billions	-0.1	-0.2
	% of TF assets	0.0	0.0
Change in TF asset value - equity risk	CZK billions	0.2	-1.8
	% of TF assets	0.0	-0.4
Change in TF asset value - property risk	CZK billions	0.1	-0.2
	% of TF assets	0.0	-0.1
Total impact of risks on TF assets	CZK billions	-1.6	-7.5
	% of TF assets	-0.4	-1.8
TF asset top-up need	CZK billions	0.8	3.4
PMC equity (end of test)	CZK billions	9.2	6.4
Capital ratio (end of test)	%	152.7	105.3
Capital injection into PMCs	CZK billions	0.0	0.9

Source: CNB
Note: Start of test: end of 2018; end of test: end of 2019. TF stands for transformed funds. PMC stands for pension management company.

Table IV.6

Year-on-year comparison of PMC stress test results in the *Adverse Scenario*

Test methodology	Last year's (FSR 2017/2018)	This year's	This year's	**This year's**
Scenario	Last year's (FSR 2017/2018)	Last year's (FSR 2017/2018)	This year's	**This year's**
Data on capital and exposures as of	31 Dec 2017	31 Dec 2017	31 Dec 2017	**31 Dec 2018**
Fall in TF asset value due to shocks considered (%)	4.1	3.9	2.5	**1.8**
TF top-up need (CZK billions)	6.5	5.3	2.7	**3.4**
Number of TFs needing top-ups	7	7	6	**7**
Injections by owners to meet capital requirements (CZK billions)	4.2	3.5	2.0	**0.9**
Number of PMCs needing capital injections to meet capital requirements	5	5	3	**3**

Source: CNB
Note: Remuneration for asset management is not included. This year's methodology includes assessment of corporate bonds underwritten by the government as government bonds and other technical changes. This year's scenario also includes a change in the method for calculating the shock to corporate bonds. PMC stands for pension management company.

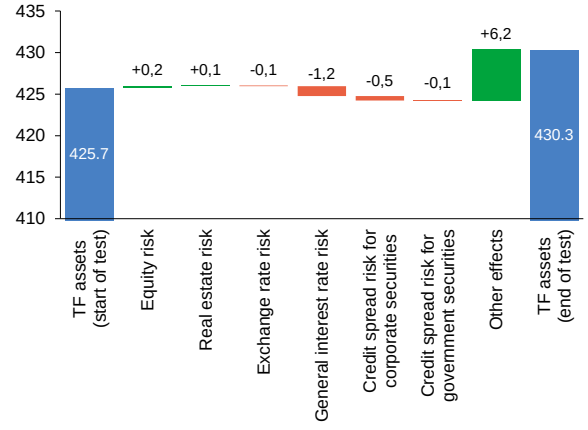
…but the PMC sector remains vulnerable to market developments

The lower capitalisation (see the combined capital surplus described in section 3.3.2) than last year means that a smaller shock in year-on-year terms may lead to a large proportion of PMCs needing to top up their TFs' assets and potentially also their own capital. In the *Baseline Scenario*, the number of companies needing to top up TFs' assets rose from three to five, but unlike last year all the PMCs should be able to withstand this scenario without topping up their capital. In the *Adverse Scenario*, seven companies top up TFs' assets again, while the number of PMCs needing capital injections decreased from five to three (see Table IV.6).

Chart IV.9

Change in the value of assets of transformed funds due to the individual types of risks in the *Baseline Scenario*

(CZK billions)

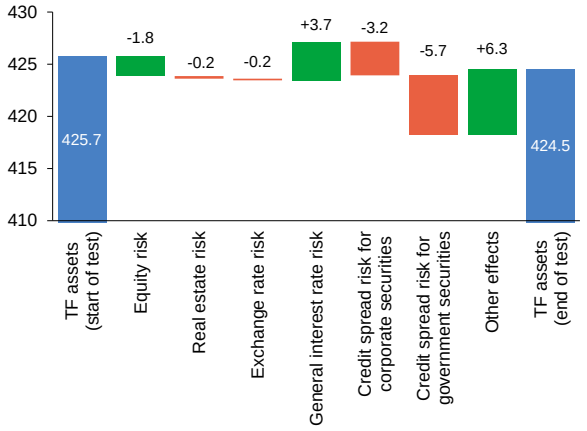


Source: CNB
Note: Other effects represent dividend income, bond coupons received, the return on the HTM portfolio and PMC's TF profit share. Change in the value of foreign-currency liabilities (cross-currency repos) is accounted for when considering exchange rate risk.

Chart IV.10

Change in the value of assets of transformed funds due to the individual types of risks in the *Adverse Scenario*

(CZK billions)



Source: CNB
Note: Other effects represent dividend income, bond coupons received, the return on the HTM portfolio and PMC's TF profit share. Change in the value of foreign-currency liabilities (cross-currency repos) is accounted for when considering exchange rate risk.

4.2 BANK LIQUIDITY STRESS TESTS AND LIQUIDITY REGULATION

The liquidity ratios confirmed the domestic banking sector's high resilience to liquidity risk

The banking sector's resilience to a short-term liquidity shock is tested using the liquidity coverage ratio (LCR). Sufficient available stable funding is monitored using the net stable funding ratio (NSFR). The aggregate LCR for the banking sector as a whole was 189% at the end of 2018[83] and all credit institutions were compliant with the regulatory limit of 100% required as from 2018 (see Chart IV.11). The NSFR was also at a sufficient aggregate level of 135% for the sector (see Chart IV.11).[84] The aggregate LCR and NSFR both rose compared with the end of 2017 and were sufficiently high during the year as well (the LCR averaging 174% and the NSFR 135%).[85] The high levels of both indicators were due to

83 The LCR in euros and dollars is below 100%. The euro- and dollar-denominated liquidity buffers were 37% and 92% respectively at the end of 2018. The euro/dollar liquidity buffer thus did not cover net expected euro/dollar outflows at the 30-day horizon at the end of 2018. No regulatory limit on the LCR in foreign currencies is set for banks.

84 A minimum standard specifying the calculation of the NSFR in the EU will be introduced by an amendment to the CRR (CRR II) expected to take effect during 2021.

85 The end-of-year LCR levels are slightly higher due to changes in banks' balance sheets relating to the optimisation of contributions to the Resolution Fund.

the composition of credit institutions' assets. The liquid assets in the LCR liquidity buffer accounted for 30% of banks' total assets at the end of 2018. The LCR liquidity buffer was composed entirely of liquid assets, to which no haircuts are applied in the case of the LCR (see Table IV.7) and which require no or very low coverage by stable funds in the case of the NSFR. The high ratios were also due to a strong base of retail deposits, which are considered stable funds subject to low expected outflows in crises (see Chart IV.12). For this reason in particular, building societies had the highest aggregate LCR. Unlike other bank groups, they traditionally have a high share of stable funds with a contractual maturity of over 3 months. On the other hand, their assets requiring coverage by stable funds in the NSFR account for almost 68% of total assets, with loans to natural persons and non-financial corporations dominating (see Chart IV.13).

Table IV.7

The LCR for groups of banks

(% of total assets of individual bank groups; as of 31 December 2018)

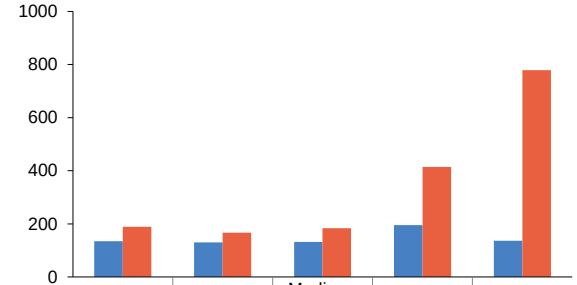
	Banks				
	Large	Medium-sized	Small	Building societies	Total
Liquid assets	30	26	47	22	30
Liquidity buffer in liquid assets	30	26	47	22	30
Weighted average rate of eligibility after application of haircuts*	100	100	100	99	100
Expected outflows	21	17	13	3	19
Balances of outflows	91	75	95	26	85
Weighted average rate of outflow*	24	23	14	13	22
Expected inflows	4	3	2	0	3
Balances of inflows	31	23	38	4	28
Weighted average rate of inflow*	12	11	6	12	22
LCR	167	184	415	779	189

Source: CNB
Note: *The extent to which items subject to haircuts, outflows or inflows in the stress period are represented in balance sheets. The results take liquidity subgroups into account and exclude state-owned banks.

Chart IV.11

Comparison of selected indicators of bank balance-sheet liquidity

(%; as of 31 December 2018)



Source: CNB
Note: The LCR is the ratio of the liquidity buffer to the net liquidity outflow of banks over a 30-day stress horizon as defined by EC Regulation 2015/61. The NSFR is the ratio of available stable funding to required stable funding as defined by Basel III. The results take liquidity subgroups into account and exclude state-owned banks.

The CNB also assesses the banking sector's liquidity using its own macro stress test…

Besides assessing short-term balance-sheet liquidity, the CNB conducts its own macro stress test.[86] The sufficiency of a bank's liquid buffer relative to the net liquidity outflow, i.e. the difference between expected outflows and inflows of liquidity, is tested over a one-year horizon (four maturity bands).[87] The model is a two-round one and takes into account the links between balance-sheet and market liquidity and the feedback reaction of the banking sector. The banking system is first hit by scenario-defined exogenous shocks, which banks react to under certain assumptions. Those reactions then change the reputation of each reacting bank and the systemic risk in the banking sector as a whole (endogenous shocks). The reactions are expressed through additional losses arising from the sale of assets from the buffer. Banks have a limited ability to increase their balance-sheet totals over the entire test period. Compared with the LCR or NSFR, the liquidity macro stress test allows for better testing of the impact of scenarios with lagged pass-through of the adverse economic situation to the quality of banks' loan portfolios and to the financial markets.

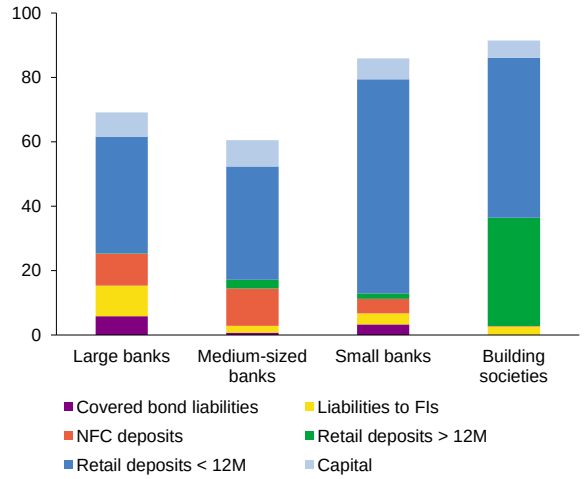
86 For details see the thematic article in FSR 2015/2016 The Relationship between Liquidity Risk and Credit Risk in the CNB's Liquidity Stress Tests.
87 The expected inflows of liquidity are limited from above so that the minimum net outflow is 30% of the expected outflow.

The stress test was applied to 20 banks having their registered offices in the Czech Republic using the *Adverse Scenario* (see section 4.1 and Table IV.8) and the end-2018 data.[88] In the first round of stress, a liquidity outflow was generated for each maturity band by increasing the asset funding requirement (see Table IV.8, lines 3.1 and 3.6) amid lower sources (lines 3.2–3.5). At the same time, the inflow of expected liquidity (lines 2.1 and 2.2) for the relevant maturity band was lowered and some assets in the liquidity buffer[89] (lines 1.1 and 1.2) were revalued.

Chart IV.12

Structure and amount of items ensuring stable funding

(% of balance sheet; as of 31 December 2018)

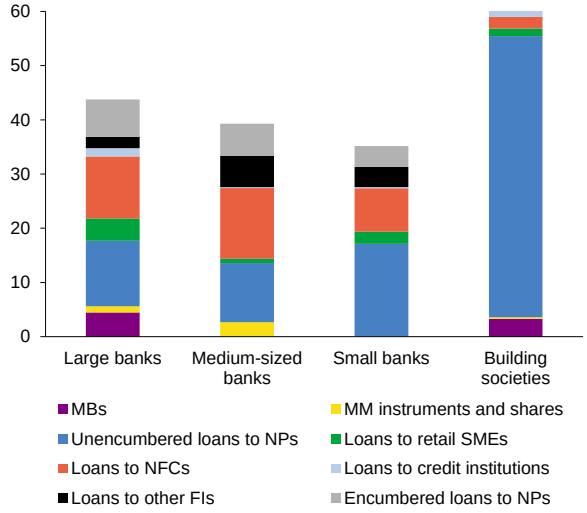


Source: CNB
Note: M = month, FIs = financial institutions, NFC = non-financial corporation.

Chart IV.13

Structure and amount of items requiring stable funding

(% of balance sheet; as of 31 December 2018)



Source: CNB
Note: MBs = mortgage bonds, NPs = natural persons, NFCs = non-financial corporations, MM = money market, FIs = financial institutions, SMEs = small and medium-sized enterprises.

…which confirmed their high resilience even over a longer stress period

The test results reveal that the banking sector as a whole would withstand the simulated stress and would be able to cover a net outflow of liquidity lasting even one year (see Chart IV.14). When the impact was measured using the aggregate decline in the total liquidity buffer, large banks were hit hardest (a decline of 75%), with a higher net outflow relative to their liquidity buffers. This year, building societies also recorded a relatively high impact (a decline of around 65%). The stress in this group of banks manifested itself as higher outflows of liquidity only from the second maturity bucket (3–6 months). However, the composition of building societies' liquidity buffer is riskier and was subject to larger haircuts over the entire stress period. Three banks would exhaust their entire buffer during the test – two in the second quarter and the third in the fourth quarter. This was mainly due to their relatively low or riskier liquidity buffer, which was not sufficient in relation to the maturity mismatch in their balance sheets and their funding stability and consequently was not enough to cover the outflows generated. However, this balance-sheet liquidity risk does not have a systemic dimension, as the assets of the banks that exhausted their liquidity buffers accounted for 4.6% of the total assets of all the banks tested.

88 State-owned banks, which have a specific business model, were not included in the stress test. The test takes liquidity subgroups into account.

89 Two liquidity buffer levels are monitored in the stress test. The level 1 liquidity buffer is defined as the sum of cash, claims on the CNB (excluding minimum reserves) and government bonds. The level 2 liquidity buffer additionally includes unencumbered corporate marketable securities.

The CNB conducted a new idiosyncratic liquidity stress test

In simple terms, the idiosyncratic testing method extends the LCR calculation method to cover a longer stress horizon. An unlikely scenario with strict parameters, created solely for this test, is applied (see Table IV.1 CB and Table IV.2 CB). In contrast to the LCR, the value of highly liquid assets such as government bonds is subject to stress in the test (see Chart IV.1 CB). The purpose of the idiosyncratic test is to simulate the moment when outflows from a credit institution exceed inflows and the counterbalancing capacity in the form of the liquidity buffer is simultaneously exhausted. In other words, the moment when the liquidity gap turns negative is tracked over the course of the stress. The results of the idiosyncratic test (see Chart IV.15) confirmed the high resilience of domestic credit institutions. Three banks ended the third month with a negative liquidity gap. Overall, this liquidity shortfall amounted to 0.44% of the assets of all the banks tested. In all, 12 of the 17 banks tested would be capable of surviving after 9 months of an extreme liquidity shock. The negative liquidity gap would be 4.2% of the total assets of the banks tested.

Table IV.8

Scenario type and shock size in the liquidity stress test

(%)

Balance sheet item/Maturity bands		< 3M	3M–6M	6M–9M	9M–12M
1. Liquidity buffer		**Interest rate and equity shock**			
1.1	Change in yield curve in pp*				
	1Y PRIBOR	-0.3	-0.5	-0.4	-0.2
	5Y GB yield	-0.4	-0.2	-0.2	-0.1
	1Y EURIBOR	0.0	0.0	0.0	0.0
	5Y EUR GB yield	0.1	0.1	0.1	0.2
1.2	Haircuts from value of capital instrument	39,0	-	-	-
2. Inflows		**Size of deduction from expected inflow**			
2.1	Secured claims	0.0	0.0	0.1	0.1
2.2	Unsecured claims due**				
	on NPs	0.4	0.4	0.1	0.5
	on NFCs and retail SMEs	0.1	0.2	0.2	0.4
3. Outflows		**Expected outflow rate**			
3.1	Drawdown of credit lines	5.0	5.0	5.0	5.0
3.2	Issued debt securities	100.0	100.0	100.0	100.0
3.3	Retail deposits				
	insured	3.3	3.1	3.3	3.1
	others	6.6	6.3	6.6	6.3
3.4	Liabilities to NFCs				
	secured	13.1	12.5	13.1	12.5
	others	26.3	25.0	26.3	25.0
3.5	Liabilities to FIs				
	secured	13.1	12.5	13.1	12.5
	others	32.8	31.3	32.8	31.3
3.6	Growth in new loans, of which***				
	Secured claims	1.2	1.7	1.5	1.0
	due to NPs	0.6	1.7	0.8	0.0
	due to NFCs and retail SMEs	0.0	4.3	0.5	0.0

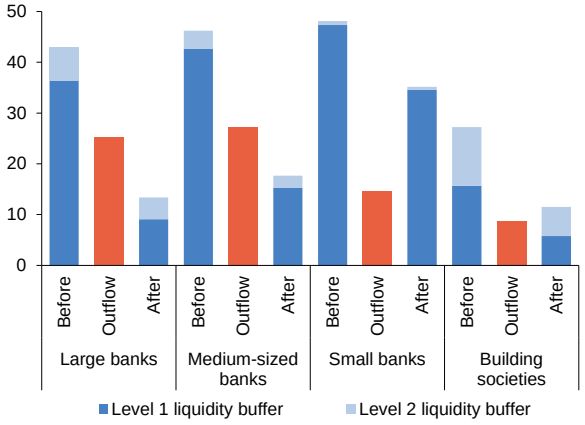
Source: CNB

Note: Note: The parameter values are the averages of those applied to individual banks. M = month, Y = year, NPs = natural persons, NFCs = non-financial corporations, FIs = financial institutions, GB = government bonds, SMEs = small and medium-sized enterprises. * The haircut is determined by multiplying the change in the yield curve by the duration of the bond portfolio. ** Due claims on financial institutions were not subject to deductions in this scenario. *** The credit growth assumption is calculated using satellite models in macro stress tests of bank solvency.

Chart IV.14

Results of the bank liquidity stress test

(% of total assets of individual groups of banks)



Source: CNB

Note: The column "Before" represents the pre-stress size of the liquidity buffer and the column "After" the post-stress size of the liquidity buffer. The column "Net outflow" represents the outflow of liquidity over the one-year horizon taking the liquidity inflow into account. The inflows are limited from above, i.e. a minimum net outflow of 30% of the expected outflow is assumed.

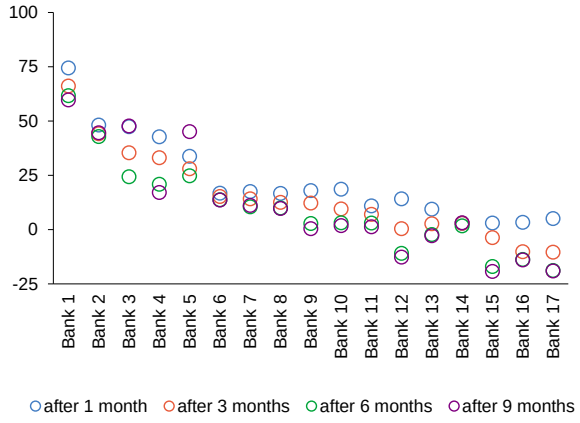
Despite a higher share of short-term liabilities to non-resident credit institutions, a strong liquidity position persists in banks

The high resilience of domestic banks to liquidity shocks is due mainly to a high share of liquid assets and a large excess of client deposits over client loans (see Chart IV.16). An elevated share of liabilities to non-resident credit institutions persists in balance sheets. Loans from non-resident credit institutions rose from 5% of total assets (January 2013) to almost 17% (February 2018). However, this type of funding source was deposited by domestic banks with the CNB. Claims on the CNB grew from 10% to around 34% of the total assets of the banking sector in the period under review.

Chart IV.15

Results of the idiosyncratic liquidity test

(liquidity gap in % of total assets)

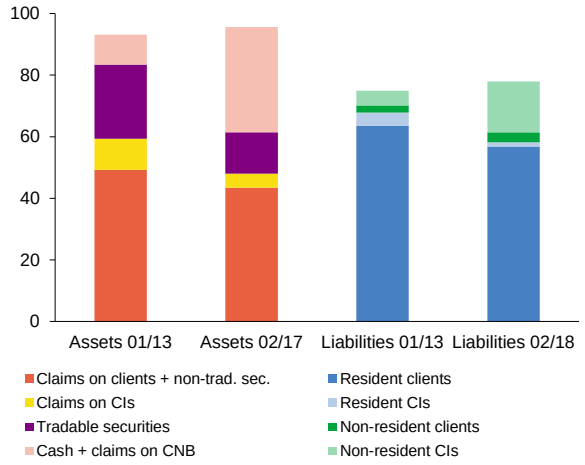


Source: CNB
Note: The results take liquidity subgroups into account and exclude state-owned banks. The liquidity gap is the final net outflow plus the final counterbalancing capacity comprising liquid assets for the month.

Chart IV.16

Selected balance-sheet items of the domestic banking sector

(% of balance sheet)



Source: CNB
Note: CIs = credit institutions.

According to banks' plans, coverage of loans by primary funds will remain high in the future

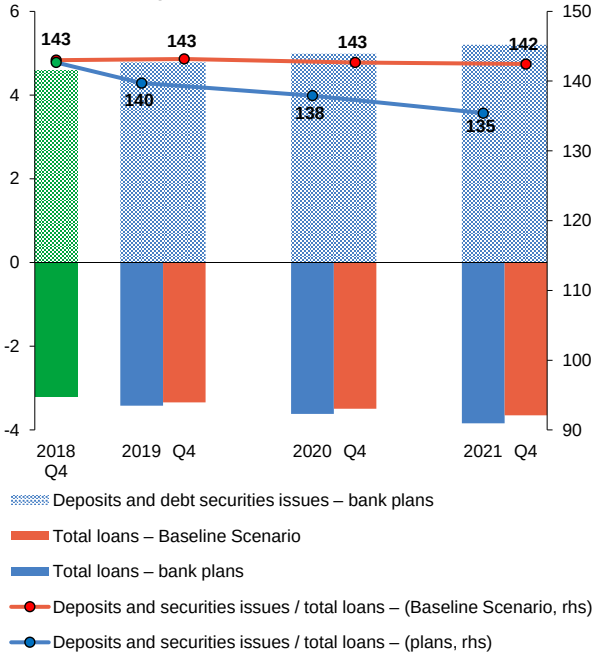
In their end-2018 funding plans, domestic banks expect loans to the private sector to increase on average by 5.6% year on year, from CZK 3.2 trillion to around CZK 3.85 trillion at the three-year horizon (see Chart IV.17). They are planning to increase private sector deposits and issuance of debt securities with maturities of at least three years from CZK 4.54 trillion to CZK 5.2 trillion.[90] The planned funds of banks would sufficiently exceed their planned loans and would even cover credit growth over the entire three-year horizon in the *Baseline Scenario* (see Table IV.1 and Chart IV.17). The three-year outlook for the coverage of loans by primary funds, i.e. the ratio of client deposits to loans, also remains high. Banks are planning to stay at similar levels in the medium term. This ratio would drop below 100% assuming slightly higher-than-planned growth in client loans (10%) and unchanged client deposits (see the simulation in Chart IV.18). These developments would force banks to cover growth in loans using other, potentially less stable, funds.

90 Banks are planning to reduce the stock of covered bonds in their liabilities by CZK 13 billion by 2021. An amendment to the Act on Bonds (190/2004 Coll.) changing the rules for covered bonds has been in effect since 4 January 2019. The changes include a minimum level of over-collateralisation and bring the rules closer into line with European regulations.

Chart IV.17

Funding plans of domestic banks

(CZK trillions; right-hand scale: %)



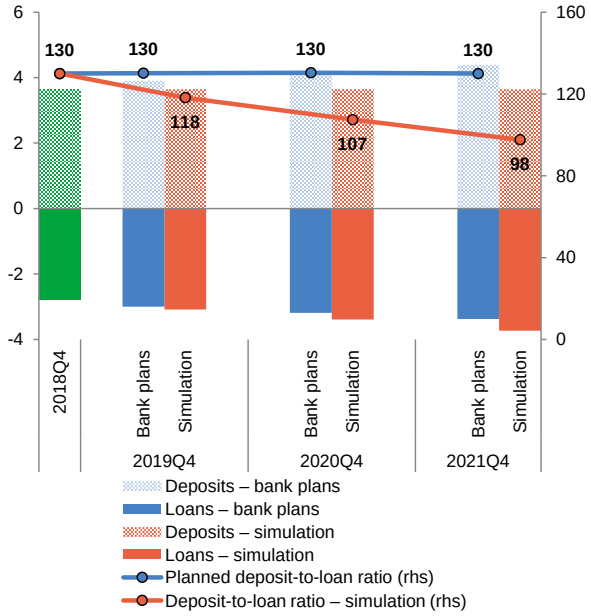
Source: CNB

Note: Includes loans and deposits to the private sector defined as households, non-financial corporations and financial institutions. Also includes debt securities with maturities equal to or more than three years. The green columns denote the position as of the end of 2018; positive values are deposits and securities issues and negative values are loans.

Chart IV.18

Comparison of planned and encumbered client deposits and loans

(CZK trillions; right-hand scale: %)



Source: CNB

Note: Clients comprise households and non-financial corporations. The simulation involves 10% year-on-year growth in loans and unchanged deposits. The green columns denote the position as of the end of 2018; positive values are deposits and negative values are loans.

4.3 THE HOUSEHOLD STRESS TEST

The total debt of households with a secured loan is growing faster than their net income

The median net income of households[91] taking out a loan secured by residential property (a mortgage loan) has increased from less than CZK 32,000 to CZK 39,000 over the last four years (see Table IV.9). Median purchase prices of property have grown even more strongly. In 2015, the median price of a mortgaged property was CZK 1,620,000, whereas in 2018 it exceeded CZK 2,381,000, an increase of 47%. This growth is in line with the general trend on the Czech property market (see section 2.1, Chart II.11) and is also largely reflected in the median value of mortgage loans, which has grown rapidly in recent years. However, households' total debt has increased faster than their mortgage loans. This suggests that property purchases may have been part financed by additional unsecured loans or that mortgage loans have been provided to clients with high additional debt (see section 5.3.1, Chart V.17 and Chart V.18).

The available data show that mortgage applicants in the 18–30 age category usually declared lower incomes than applicants in higher age categories (see Table IV.10). Nevertheless, the loan amounts in this age category were the highest. This may reflect the fact that when they purchased property, households in higher age categories had higher savings accumulated in previous years. In the data sample under review, this is particularly apparent in the 51+ age group.

Table IV.9

Median values of loans to households for house purchase

	2015	2016	2017	2018
Loan size (CZK thousands)	1,400	1,500	1,562	1,710
Year-on-year change (%)		7.14	4.13	9.48
Property purchase price (CZK thousands)	1,620	1,900	2,190	2,381.6
Year-on-year change (%)		17.28	15.26	8.75
Net monthly income (CZK thousands)	31.9	32.7	36.7	39.1
Year-on-year change (%)		2.43	12.57	6.37
Client's total debt (CZK thousands)	1,740	1,968.3	2,075	2,290.5
Year-on-year change (%)		13.12	5.42	10.38

Source: CNB

Table IV.10

Median values of loans to households for house purchase by age category in 2018 H2

(CZK thousands)

	18–30	31–50	51+
Share in survey (%)	27%	66%	7%
Loan size	1,915	1,800	1,400
One client	1,650	1,650	1,250
More than one client	2,304	2,000	1,500
Property purchase price	2,150	2,550	2,246
One client	1,980	2,359	2,110
More than one client	2,500	2,810	2,400
Net monthly income	32.6	42.7	45.8
One client	26.2	33.9	34.2
More than one client	41.8	49.6	53.7
Total debt	2,211	2,377	1,848
One client	1,900	2,081	1,571
More than one client	2,698	2,668	2,118

Source: CNB

91 This section of the Report analyses households that took out a loan secured by residential property. The data source for the analyses below is anonymised data from the Survey of new loans secured by residential property, conducted by the CNB since 2015.

The household stress test enables the sector's resilience to be assessed

The household stress test[92] focuses on the risk of overindebtedness of households, whose potential debt service problems could transform into financial sector credit risk. This year's household stress test is based on the concept of borrowers' financial reserve for repaying debt under stress and that of the maximum hypothetically repayable loan.[93] The size of the financial reserve is derived from the borrower's net income minus essential expenditures, property maintenance costs and loan instalments. The financial reserve is deemed risky if it falls below 10% of the borrower's net income.[94] Households with a reserve below this level are considered "overindebted". The maximum hypothetically repayable debt is set on the basis of the maximum possible monthly loan instalment, which is equal to net monthly income minus essential expenditures, property maintenance costs and the minimum reserve (10% of net income). The resulting maximum monthly instalment is then multiplied by the number of repayment periods, where the length of this period is determined by the length of the borrower's economic activity, with the maximum possible maturity set at 30 years (360 months).

Table IV.11

Stress test structure

		Actual value	*Baseline Scenario*	*Adverse Scenario*	
		2018	2019	2019	
1st part	Comparison of overindebted households by scenario				Chart IV.19
2nd part	Comparison of overindebted households by DSTI			*Adverse scenario* 2019 + increase in interest rates of: 1 pp 3 pp 5 pp	Chart IV.20 Chart IV.21
				Adverse scenario 2019 + increase in interest rates of: 3 pp	Chart IV.22
3rd part	Ratio of total household debt to maximum hypothetically repayable loan by DTI	Minimum reserve of 10% of net income			Chart IV.23

Source: CNB

Table IV.12

Key variables in the individual stress test scenarios

(%)

	Actual value	*Baseline Scenario*	*Adverse Scenario*
	2018	2019	2019
Inflation (y-o-y CPI)	2.07	2.22	1.57
Nominal wage growth (y-o-y)	7.80	6.51	-1.39
Interest rate on consumer credit	8.63	8.84	8.24
Interest rate on mortgage loans	2.92	3.13	2.53

Source: CNB
Note: Interest rates are rates on koruna loans provided by banks to households in the Czech Republic. The rates predicted for 2019 are based on the prediction of government bond yields.

The stress test consists of several parts, each offering an alternative view of households' resilience (see Table IV.11). In the first part of the stress test, the financial situation of households (their financial reserve) in 2018 is compared with the situation in 2019 if the *Baseline Scenario* and the *Adverse Scenario* were to materialise (see Table IV.12). The second part of the stress test involves tracking households' financial situation under the *Adverse Scenario*, for which an additional shock in the form of a rise in interest rates is also simulated. This additional stress enables a potential increase in credit risk in the event of particularly adverse developments to be assessed. The last part of the stress test, based on the concept of the maximum hypothetically repayable loan, compares the size of the hypothetically repayable loan with the size of the actual loan. In this test, households are deemed overindebted if the ratio of the actual loan to the hypothetically repayable loan exceeds 100%.

92 The household stress test is conducted on data for individual households that took out a loan secured by residential property between 2015 H2 and the end of 2018.
93 The methodology is described in more detail in the thematic article The Introduction and Calibration of Macroprudential Tools Targeted at Residential Real Estate Exposures in the Czech Republic in FSR 2017/2018.
94 The figure of 10% of net income reflects the average household saving rate (see the thematic article The Introduction and Calibration of Macroprudential Tools Targeted at Residential Real Estate Exposures in the Czech Republic in FSR 2017/2018).

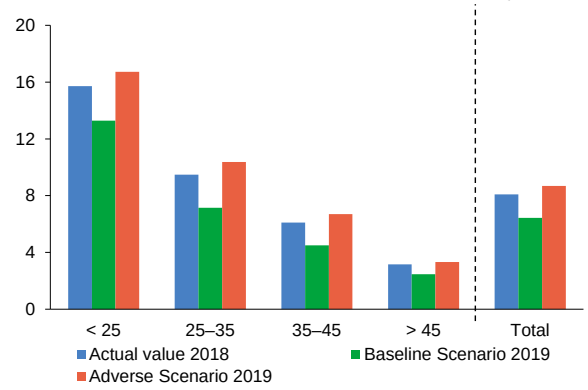
The share of overindebted households with a mortgage is highest for borrowers with a net monthly income below CZK 25,000 in both scenarios

In 2018, almost one-sixth of households with a net monthly income of less than CZK 25,000 were exposed to increased financial stress as defined by a very low (less than 10% of net income) or even negative financial reserve (see Chart IV.19). If the *Baseline Scenario* were to materialise, the share of overindebted low-income households would fall by about 2.5 pp compared with 2018. The lower risk is due mainly to the strong wage growth forecasted for 2019. Were the *Adverse Scenario* to materialise, the share of overindebted households would conversely rise at the end of 2019. The substantial ratio of overindebted low-income households points to their increased sensitivity to adverse economic developments. The environment of strong consumer optimism and strong demand for debt-financed owner-occupied housing could thus lead to the financial default of large proportion of low-income households in the future. The share of overindebted households in the category of households with a net income of CZK 25,000–CZK 35,000 is almost half that in the low-income group (income below CZK 25,000), and in the income category of CZK 35,000–CZK 45,000 it is only one-third. The risk of default among high-income households with a net monthly income of more than CZK 45,000 is low.

Chart IV.19

Shares of overindebted households with a mortgage by income group

(x-axis: borrower's net income in CZK thousands; y-axis: %)



Source: CNB
Note: The calculation of the financial reserve in 2018 is based on data from Survey, with data from 2015, 2016 and 2017 adjusted for an income and price inflation.

A potential rise in interest rates will mainly hit households with a DSTI of over 45%

The second part of the stress test examined the financial situation of households in the event of a rise in interest rates. The test is based on the assumption that the *Adverse Scenario* for 2019, for which additional increases in rates of 1, 3 and 5 pp were also simulated, materialises. The simulation maintained the contractual mortgage fixation periods, so the growth in interest rates affected less than 10% of loans. Floating rates were assumed in the case of additional debt.

This part of the stress test confirmed the sector's relatively high resilience to potential growth in interest rates when the ratio of debt service to net income is below 40%. However, the risk of default rises when the ratio is above this level and climbs sharply when it exceeds the recommended 45% level.[95] Assuming materialisation of adverse developments, an additional increase in interest rates of 1 pp can thus lead to increased financial stress for more than half of highly indebted households

95 See Official Information of the CNB of 12 June 2018: Recommendation on the Management of Risks Associated with the Provision of Retail Loans Secured by Residential Property. (https://www.cnb.cz/export/sites/cnb/en/legislation/.galleries/official_information/vestnik_2018_08_21018180_en.pdf).

with an income of less than CZK 25,000 (see Chart IV.20) and almost one-third of highly indebted households with an income of more than CZK 25,000 (see Chart IV.21). A sharper increase in interest rates coupled with a cooling of the economy and unfavourable income developments would further increase the share of households at risk.

Almost one-fifth of all mortgage loans were provided to households with a DSTI ratio of over 45%

The results of the second part of the household stress test also indicate that almost one-third of households with a DSTI ratio of over 45% would get into a very unfavourable financial situation characterised by a negative financial reserve if the *Adverse Scenario* supplemented by an additional increase in interest rates of 3 pp were to materialise. Just 3% of households with a DSTI ratio of 40%–45% would face the same situation. This reflects a sharp drop in credit risk. However, almost one-tenth of households with a DSTI ratio in this range would have a financial reserve of less than 10% of their net income (see Chart IV.22). A DSTI ratio of below 40% thus seems sufficiently safe and a DSTI ratio of over 45% insufficiently safe from the financial stability perspective (see section 5.3.1).

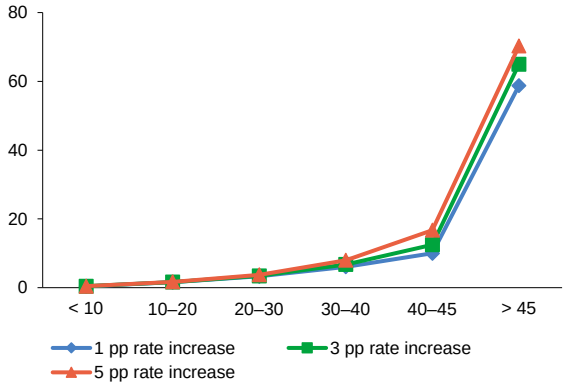
Households drawing loans with a DTI ratio of over 10 do not usually have a sufficient financial reserve

The results of the third part of the household stress test reveal that the current debt of almost one-fifth of households exceeds the maximum hypothetically repayable loan. These households may thus get into an unfavourable financial situation in the future. Risk is accumulating particularly among households with a DTI ratio of over 10 (see Chart IV.23). In response to this potential risk, the CNB has issued a DTI recommendation according to which the ratio of applicants' total debt to their net income should not exceed 9 (see section 5.3.1).[95]

Chart IV.20

Shares of overindebted households with net income below CZK 25,000 by DSTI ratio

(x-axis: DSTI ratio in %; y-axis: %)

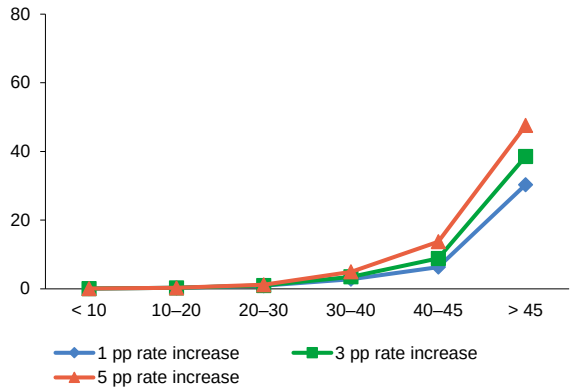


Source: CNB
Note: The simulation of growth in interest rates maintained the contractual fixation periods negotiated when concluding the mortgage agreement. Full refixation based on the chosen scenario is assumed for clients' additional debt. Interval closed from the right.

Chart IV.21

Shares of overindebted households with net income over CZK 25,000 by DSTI ratio

(x-axis: DSTI ratio in %; y-axis: %)

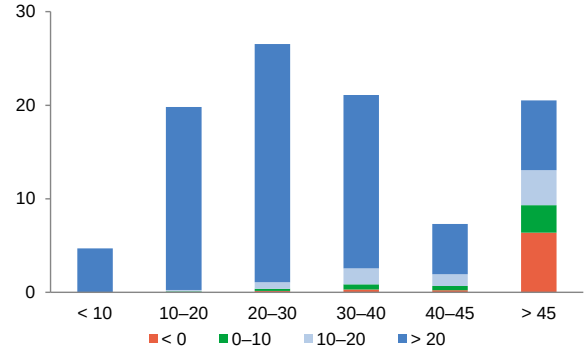


Source: CNB
Note: The simulation of growth in interest rates maintained the contractual fixation periods negotiated when concluding the mortgage agreement. Full refixation based on the chosen scenario is assumed for clients' additional debt. Interval closed from the right.

Chart IV.22

Classification of loans by DSTI ratio and financial reserve under stress

(x-axis: DSTI ratio in %; y-axis: share of loans in %)

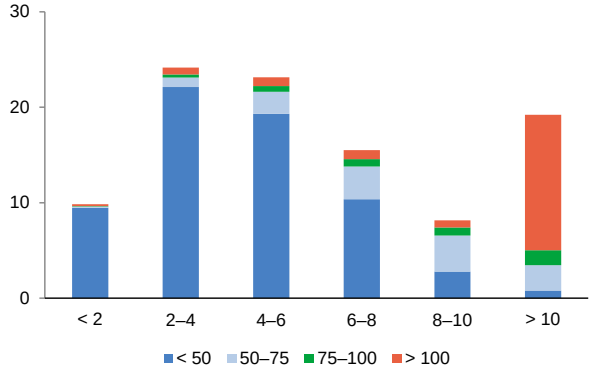


Source: CNB
Note: The shades reflect the size of the financial reserve in per cent of net income (colour scale below the chart). The simulation of growth in interest rates maintained the contractual fixation periods negotiated when concluding the mortgage agreement. Full refixation based on the chosen scenario is assumed for clients' additional debt. Interval closed from the right.

Chart IV.23

Classification of loans by DTI ratio and ratio of all loans provided to hypothetically repayable loan

(x-axis: DTI ratio; y-axis: share of loans in %)



Source: CNB
Note: The shades in the chart indicate the ratio of the loan provided to the hypothetically repayable loan (colour scale below the chart). For the maximum hypothetically repayable loan it is assumed that households have a reserve of 10% of their net income. Interval closed from the right.

4.4 THE PUBLIC FINANCE STRESS TEST

The CNB reviews and evaluates the risks of concentration of sovereign exposures

Since 2015, based on its internal methodology, the CNB has been annually reviewing and evaluating the risks of concentration of exposures to sovereign issuers in the balance sheets of credit institutions having their registered offices in the Czech Republic.[96] In its *Financial Stability Reports* it informs the market about which sovereign exposures it has identified as systemically important and whether it will require relevant credit institutions to meet an additional capital requirement to cover the risk of concentration of these exposures at a three-year horizon. The methodology defines an important sovereign exposure as an exposure to a sovereign issuer with a minimum ratio of 100% to the credit institution's eligible capital. It becomes systemic if the assets of credit institutions with important sovereign exposures exceed 5% of the total assets of all the credit institutions operating in the Czech Republic, including branches of foreign banks. It is indicated that an additional capital requirement must be met if the three-year outlook for the credit risk indicator of the sovereign issuer (sovereign risk indicator, ISR) exceeds one of its thresholds.[97] The CNB requires additional capital where the credit institution holds exposures in excess of the limit and this above-limit exposure is not already sufficiently covered by capital.[98]

Exposures to Czech government debt were assessed as systemically important…

The CNB assessed domestic credit institutions' investments in Czech government bonds as a systemically important sovereign exposure. The value of these exposures rose by CZK 45 billion year on year to CZK 530 billion at the end of 2018, accounting

96 The internal methodology is described in FSR 2014/2015 and at https://www.cnb.cz/export/sites/cnb/en/financial-stability/.galleries/stress_testing/download/methodology_review_evaluation_of_sovereign_exposure_concentration_risk.pdf.

97 The CNB primarily monitors two thresholds for the sovereign risk indicator (ISR): a soft threshold of 5% indicating the creation of an additional capital requirement where an additional expert analysis proves this to be necessary, and a hard threshold of 8% indicating unconditional creation of an additional capital requirement.

98 The above-limit part of a sovereign exposure is determined using the ISR where the latter exceeds its thresholds. The ISR provides a simplified assessment of the risk of default on a sovereign exposure. The threshold separating the limit and above-limit parts of a sovereign exposure gradually falls as this indicator increases. As a result, the above-limit part rises. The highest effective limit is 222% and the lowest is 0%.

for 8% of these institutions' total assets and around 106.5% of their total capital. Although the institutions' holdings of government bonds increased overall, the number of institutions with significant sovereign exposures declined. The assets of institutions with significant sovereign exposures accounted for 42.7% of total assets, as against 47% a year earlier. Exposures to other governments, the EU and the EIB were not found to be systemically important.

…but their riskiness did not exceed the thresholds

The ISR was estimated for systemically important exposures. Its three-year outlook was 0.66% (see Table IV.13) and did not exceed the supervisory thresholds of 5% and 8%. The CNB will therefore not require credit institutions having their registered offices in the Czech Republic to meet an additional capital requirement to cover the risk of concentration of exposures to the Czech government.

Table IV.13

Czech public finance stress test

(%)

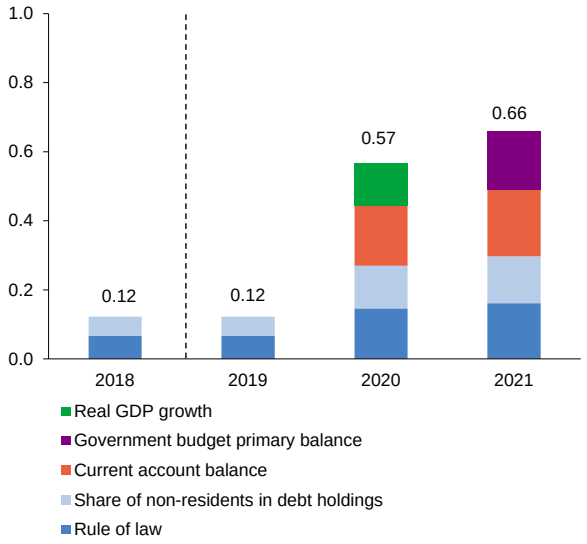
	*Actual value**	*Adverse Scenario*			Critical limit
	2018	2019	2020	2021	
Macroeconomic variables					
Real GDP growth (%)	2.8	-0.7	-4.9	-1.4	< -2.3
Current account balance (% of GDP)	0.5	2.0	-3.9	-4.8	< -1.8
Gross national savings (% of GDP)**	27.1	27.1	27.1	27.1	< 19.3
External debt (% of GDP)**	81.9	81.9	81.9	81.9	> 99.6
Difference between real 10Y GB yield and real GDP growth (pp)	-2.9	0.7	6.1	4.9	> 6.3
Fiscal variables					
Government debt (% of GDP)	32.7	32.0	37.6	42.8	> 64.7
Primary balance (% of GDP)	2.1	1.7	-1.7	-3.6	< -3.2
10Y government bond yield (%)	2.0	1.9	2.8	3.2	> 10.8
Government debt maturing within one year (% of GDP)	5.5	5.2	5.9	6.3	> 19.0
Share of government debt maturing within one year (%)	16.8	16.3	15.7	14.7	> 21.7
Share of foreign currency debt (%)	13.7	16.3	12.6	3.4	> 27.1
Share of non-residents in debt holdings (%)**	40.3	40.3	40.3	40.3	> 34.9
Institutional variables					
Government effectiveness (WGI score)**	1.0	1.0	1.0	1.0	< 1.0
Political stability (WGI score)**	1.0	1.0	1.0	1.0	< 0.8
Rule of law (WGI score)**	1.1	1.1	1.1	1.1	< 1.2
Banking crisis	No	No	No	No	= Yes
Past sovereign defaults	No	No	No	No	= Yes
Sovereign risk indicator (ISR, %)	**0.12**	**0.12**	**0.57**	**0.66**	

Source: CNB, CZSO, ECB, World Bank
Note: The symbol > (< or =) denotes that a higher (lower or equal) value means breaching of the critical limit and indication of increased risk. The figures are rounded. Indications of breaching of the critical limit are based on unrounded figures. Where the limit is breached, the relevant variables are further indicated in red. * Values known when Inflation Report I/2019 was being prepared. ** Variable not modelled; last known value assumed in projection.

Chart IV.24

Decomposition of the sovereign risk indicator in the *Adverse Scenario*

(%)



Source: CNB, World Bank
Note: The vertical line divides the actual situation from the scenario horizon. Year-end data.

Few of the variables under review exceeded the critical limit…

The onset of the crisis assumed in the *Adverse Scenario* was gradual. With the exception of rule of law and the share of foreign holders of government debt, which are already now regarded as highly risky in terms of the ISR, none of the variables included in the ISR exceeded the critical limit in 2019. The ISR thus stayed at 0.12% (see Table IV.13 and Chart IV.24). In 2020, real GDP growth and the current account deficit also exceeded the critical limit in the *Adverse Scenario*, although the former returned below it the following year, However, the indicator of the general government primary balance newly exceeded the critical limit. As a result, the ISR rose to 0.57% in 2020 and 0.66% in 2021. Total government debt grew to 42.8% of GDP at the three-year test horizon. The deterioration in public finances was due mainly to lower tax revenue during a strong recession (see section 2.1.3 and Table IV.13). On the financial market, nominal Czech government bonds yields increased primarily at the longer end of the koruna yield curve. The ten-year government bond yield rose to 3.2% at the three-year test horizon due to growth in the risk premium. However, debt service costs did not rise significantly as a result, as a large part of interest costs at the test horizon consist of debt instruments issued in the past. Moreover, the growth in nominal Czech government bonds yields is not too high owing to the assumed drop in monetary policy rates.

…and the low ISR level was also due to more favourable evolution of Czech government finances

Czech government debt declined again year on year at the end of 2018 – by CZK 9 billion to CZK 1,741 billion. In relative terms, it has been decreasing since 2013, from 44.9% of GDP to 32.7% in 2018, due mainly to renewed economic growth. The favourable trends in these two variables reduced the impacts of the stress scenarios (see Chart IV.25) and were reflected in low levels of the three-year ISR. Government debt stayed well below the "debt brake" of 55% of GDP[99] at the three-year horizon even in an adverse macroeconomic situation. Czech government CDS spreads also remain low, although they have risen since last year as a result of heightened global risk perceptions on financial markets (see section 2.1).

The external environment remains the main medium-term source of risk for the public sector…

Viewed through the lenses of the ISR indicator, materialisation of the *Adverse Scenario*, which assumes a marked drop in economic activity abroad, is currently the biggest risk to Czech public finance sustainability. This would mean a drop in GDP, a primary government budget deficit and a current account deficit. The deterioration of macroeconomic fundamentals would probably be amplified by adverse sentiment on the bond market. Sudden shifts by investors into assets of the safest countries could lead to a correction in the prices of Czech government bonds and higher interest costs of new issues. The impact of higher debt service costs is simultaneously mitigated by low government debt and a high proportion of funding in the domestic currency.[100] The share of non-residents in holdings of Czech government debt has decreased since its peak in mid-2017 but is still relatively high, exceeding 34.9%. This level is regarded as risky by the CNB. Foreign investors are more sensitive to market sentiment and more focused on short-term profit and their investment strategies tend to be correlated. Larger-scale sell-offs by non-residents may thus have the potential to destabilise market prices, particularly in an environment of lower market liquidity. The risk of flight by foreign investors is partly mitigated by the higher residual maturity of their bond holdings. The average residual maturity of koruna government bonds, which non-residents hold in much greater quantities than foreign currency bonds, was 4.7 years at the end of 2018, 0.6 of a year more than the average for 2017.

99 Under Article 14 of Act No. 23/2017 Coll., on Budget Responsibility, the government must take steps leading to sustainable public finances if general government debt net of a cash reserve exceeds 55% of GDP. This does not apply if the economy is in a recession or recovering after a crisis.

100 The low share of government debt issued in foreign currencies (13.7%) means that the domestic government sector is facing low exchange rate risk.

…together, in the longer run, with the domestic government's over-expansionary expenditure policy

Total general government primary expenditure grew by 9.3% in 2018 due to both current and capital expenditure. This represents a sharp rise compared with previous years. The higher growth in current expenditure, due mainly to valorization of pensions and wage growth in the public sector, has a lasting impact on the expenditure side of the budget. The potential onset of a recession or an economic crisis leading to a fall in tax revenue could result in higher primary deficits than in the past and push government debt upwards. Unlike in 2018, the primary deficit thus exceeded the critical limit again at the three-year horizon after the application of this year's stress scenario (see Table IV.13). While the higher government investment activity may increase the potential output of the economy, a high share of mandatory expenditure in a situation of a worse economic outlook and the presence of macroeconomic risks (see section 2.1) limits the room for fiscal policy to perform its stabilising function and for resolving future structural problems related to population ageing.[101]

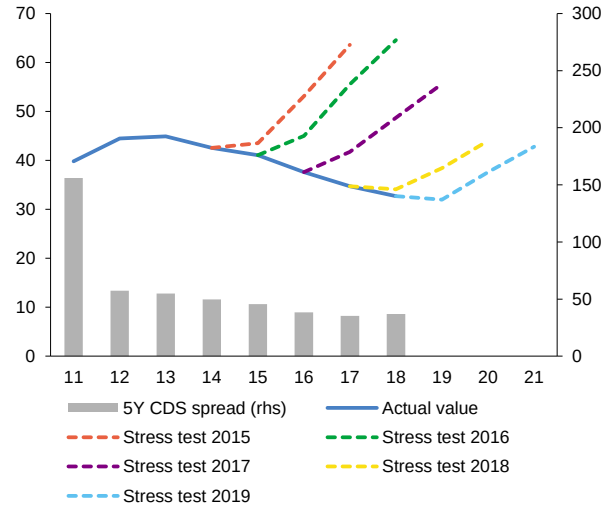
The average residual maturity of government debt increased, leading to a drop in refinancing risk

In previous Financial Stability Reports, the CNB noted the relatively short average maturity of Czech government debt. The average maturity of koruna government bonds reached a low of 4.4 years in August 2017. By the end of 2018, it had risen to 5.8 years, entering the tolerance band around the Ministry of Finance's medium-term objective of six years with a permissible deviation of 0.25 of a year.[102] The average maturity of government debt in the Czech Republic is still short by European standards, as the European average is 1.7 years longer. The United Kingdom had the longest average maturity (15 years, see Chart IV.26).

Chart IV.25

Comparison of the trajectories of public debt in the public finance stress tests

(% of GDP; right-hand scale: bp)

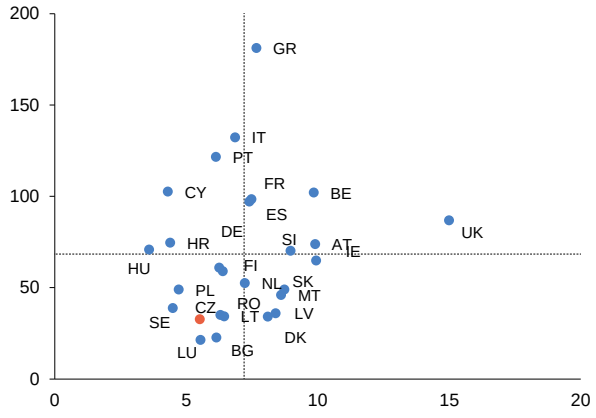


Source: Thomson Datastream
Note: Year-end data.

Chart IV.26

Government debt in EU countries and its average maturity

(x-axis: maturity in years; y-axis: debt in % of GDP)



Source: ECB, Eurostat
Note: The Czech Republic is indicated in red. The lines represent the unweighted average for the 27 EU countries. Data are not available for EE.

101 Czech Fiscal Council (2018): Report on the Long-Term Sustainability of Public Finances, and Ambriško et al. (2017): Assessing Fiscal Sustainability in the Czech Republic, CNB RPN 2/2017.
102 Ministry of Finance (2018): The Czech Republic's Funding and Debt Management Strategy for 2019.

5 MACROPRUDENTIAL POLICY

Pursuant to Article 2 of the Act on the CNB, the CNB maintains financial stability and sees to the sound operation of the financial system in the Czech Republic. To achieve these objectives, it conducts macroprudential policy. To this end, it uses a set of macroprudential instruments focused mainly on the banking sector, which is the largest sector in the domestic financial system. This section evaluates the current position of the Czech economy in the financial cycle, the resilience of the domestic financial sector to the risks identified, and the tasks and recommendations arising from analyses for the settings of the CNB's macroprudential policy instruments. The first part of this section briefly introduces the intermediate objectives of macroprudential policy and the macroprudential policy instruments available for fulfilling those objectives. It places them into context with the conclusions of the assessment of the relevant risks. The second part describes the settings of the capital buffers used to enhance the resilience of the domestic banking sector. The third part provides detailed information about risks relating to property exposures and describes current and potentially applicable instruments for mitigating those risks.

5.1 THE CNB'S MACROPRUDENTIAL POLICY OBJECTIVES AND INSTRUMENTS

The CNB sets its macroprudential policy instruments on the basis of an assessment of the intensity of systemic risks. In conformity with an ESRB recommendation, it focuses on the fulfilment of intermediate objectives (see Table V.1) reflecting the existence of several sources of systemic risk and their own transmission mechanisms.

Table V.1 Summary of intermediate objectives and macroprudential instruments and evolution of specific risks

Intermediate objectives	Specific risk	Existence of specific risk in CZ	Key instruments	Applied in CZ	Detailed information
Mitigate excessive credit growth and leverage	Strong credit recovery accompanied by easing of lending standards	Yes	Countercyclical capital buffer	Yes, 1.25% from 1/2019; 1.5% from 7/2019; 1.75% from 1/2020; 2.0% from 7/2020	5.2
	Rising leverage, rising off-balance sheet risk	Potential	Macroprudential leverage ratio	No	-
	Low risk weights of significant credit portfolios	Potential	Macroprudential tool to mitigate systemic risk at Member State level (Article 458 CRR)	No	Box 3.1
	Elevated growth in loans and risks in specific sector	Potential	Sectoral capital requirements (in particular real estate exposure)	Not as yet, CNB reacts to property exposure risks with other instruments	-
	Risk of spiral between property prices and property financing loans	Yes	LTV caps	Yes, since 2015, tightened in 2016 and 2017	5.3
	Risk of excessive household indebtedness and debt service	Yes	LTI, DTI, LSTI, DSTI caps	Yes, DTI and DSTI since 2018	5.3
Mitigate excessive maturity mismatch and illiquidity	Long-term liquidity risk	Potential	Macroprudential NSFR	Microprudential general requirement since 2016	4.2
	Short-term liquidity risk	No	Macroprudential LCR	Microprudential minimum standard since 2015	4.2
Limit exposure concentrations	Property exposure concentration	Potential	Systemic risk buffer	Not as yet, CNB reacts to property exposure risks with other instruments	-
	Sovereign exposure concentration	Yes	Public finance stress test	Yes, option of additional capital requirements in event of elevated sovereign risk, since 2015	4.4
Limit misaligned incentives	Potential impacts of problems in SIFIs on financial market stability and real economy	Yes	SIFI capital surcharges (G-SII and O-SII buffer)	No, O-SIIs identified, different instrument applied	5.1
		Yes	Systemic risk buffer	Yes, since 2017 for five banks	5.1
Strengthen resilience of financial infrastructures	Counterparty default risk, interconnectedness of financial infrastructures	No	Margin and haircut requirements on CCP clearing	No	-
			Increased disclosure	No	-
			Systemic risk buffer	No	-

Source: CNB
Note: The main goal of these instruments is to strengthen the resilience of the banking sector, not to mitigate systemic risk. The classification of intermediate objectives and instruments is based on Recommendation of the ESRB of 4 April 2013 on intermediate objectives and instruments of macro-prudential policy (ESRB/2013/1).

Among the most important macroprudential instruments in the current regulatory framework defined in CRD IV/CRR are capital buffers, which are applied on top of the 8% minimum capital requirement and the Pillar 2 requirements (see section 3.2.1). The CNB currently applies three capital buffers to increase the resilience of the banking sector (see Table V.2). The buffer rates[103] reflect the cyclical and structural characteristics of the Czech banking sector.

The capital conservation buffer is used to absorb losses in adverse phases of the cycle. It has applied to all banks in the Czech Republic since 2014 at a rate of 2.5%.[104] This rate will not change over time. The countercyclical capital buffer (CCyB) is intended to reduce the risks associated with excessive credit growth and leverage, i.e. risks connected with banking sector vulnerability accumulated in the favourable phase of the financial cycle. The CNB set the CCyB rate at 0.5% at the end of 2015 and has increased it five time since then. At the time of publication of this FSR, the CCyB rate applied to exposures in the Czech Republic is 1.25%. Over the last year, the CNB Bank Board decided to increase it to 1.5% with effect from July 2019, 1.75% with effect from January 2020 and 2% with effect from July 2020. The justification and underlying arguments for the Bank Board's most recent decision, taken at its May meeting this year, is contained in section 5.2. The systemic risk buffer can be used to suppress various sources of non-cyclical risks to banking sector stability. The CNB currently uses it to mitigate the risks associated with the existence of systemically important banks. Since 2017, five systemically important banks have been required to maintain a non-zero buffer, with rates ranging between 1% and 3%. The legislation favours the application of a buffer for other systemically important institutions (O-SIIs) to mitigate risks connected with the systemic importance of banks. However, this buffer can be set at a maximum of 2%, which may not be sufficient in the case of the Czech Republic.[105] The CNB updates the list of other systemically important institutions[106] every year but does not actively apply the O-SII buffer. However, this will change as regulatory changes to the macroprudential framework enter into force. Under these changes, it will be necessary to apply the O-SII buffer to mitigate risks associated with the systemic importance of banks (see Box 5.1). At the time of publication of this Report, the sum of the capital buffers – the "combined capital buffer" – is 3.75%–6.75% depending on the institution's systemic importance.

Table V.2

Summary of capital buffers in the Czech Republic

(%)

Capital buffer	Rate	Date of effect	Rate applied at time of publication of FSR
Capital conservation buffer	2.50	2014	2.50
Countercyclical capital buffer	2.00	7/2020	1.25
Systemic risk buffer	1.00 – 3.00	2014	1.00 – 3.00
Buffer for other systemically important institutions	-	-	-

Source: CNB

Since 2016, the CNB has identified marked growth in property prices accompanied by strong growth in property purchase loans as the most significant domestic risk. Since 2015, it has been applying the instruments formulated in its Recommendation[107] to mitigate risks associated with the provision of retail loans secured by residential property. The CNB

103 More detailed information about buffer rates and other macroprudential policy instruments in the Czech Republic can be found on the CNB website: https://www.cnb.cz/en/financial-stability/macroprudential-policy/.

104 The buffer rate is expressed as the ratio of best-quality capital (Common Equity Tier 1) to the total risk exposure.

105 See Skořepa, M., Seidler, J. (2013): *An Additional Capital Requirement Based on the Domestic Systemic Importance of a Bank,* thematic article, FSR 2012/2013.

106 For details, see the CNB website: https://www.cnb.cz/en/financial-stability/macroprudential-policy/list-of-other-systemically-important-institutions/.

107 More detailed information is available in the *Recommendation on the management of risks associated with the provision of retail loans secured by residential property*.

currently recommends that lenders should not provide such loans with LTVs of over 90% (the "individual limit") and should limit the provision of loans with LTVs of 80%–90% to 15% of new loans in the quarter (the "aggregate limit"). In addition, the CNB introduced caps on the debt-to-income (DTI) ratio of nine annual incomes and the debt service-to income (DSTI) ratio of 45% with effect from October 2018. Section 5.3.1 provides a more detailed description of the risks associated with the residential property market and mortgage lending and of the configuration of the instruments used to mitigate these risks. It also includes information on minor changes and clarifications made to some provisions of the Recommendation.

In recent years, the CNB has ranked among the most active macroprudential authorities in the EU.[108] It monitors the activities, risk assessment approaches and measures of other macroprudential authorities. It also analyses the cross-border effects of macroprudential measures in connection with the framework for mutual recognition of macroprudential measures (reciprocity). In 2018, the CNB decided on the reciprocation of macroprudential measures activated in Belgium, France and Sweden.[109] In all cases, it decided not to reciprocate the measures given the very limited relevant exposures of domestic banks.

BOX 5.1: MOST IMPORTANT CHANGES TO THE CRD V/CRR II MACROPRUDENTIAL FRAMEWORK

In December 2018, the European Council and the European Parliament agreed on changes to the CRD V/CRR II regulatory package, including a modification of the macroprudential framework. An important change brought in by these legislative amendments is the introduction of two binding regulatory instruments – a net stable funding ratio requirement and a leverage ratio requirement. The final shape of the two instruments was subject to a series of discussions about their settings. Particularly important was the debate on possible national discretion in calibrating the leverage ratio, as recommended by the Basel Committee on Banking Supervision. According to its recommendation, it would be possible under exceptional macroeconomic circumstances to temporarily exclude exposures to the central bank from the denominator of the leverage ratio and simultaneously to reset its minimum required level. The CNB supported this option, as it would have allowed the rise in bank deposits at the CNB connected with the marked increase in the CNB's international reserves, and hence in the denominator of the leverage ratio, to be taken into account. However, the discretion was not included in the final version of the regulatory package. The regulatory package removes the option of using Pillar 2 for macroprudential purposes. This is justified by a need for a clearer division of powers between supervisory and macroprudential authorities.

An adjustment concerning the systemic risk buffer (SRB) is a substantial change in the CRD V/CRR II macroprudential framework from the CNB's viewpoint. Under the new legislation, it will not be possible to apply the SRB to mitigate

108 An overview of macroprudential policy in other Member States is provided in the annual report *A Review of Macroprudential Policy in the EU*.

109 Under Article 458 of CRR, Belgium increased risk weights by five percentage points across the board and proportionately increased the risk weights of 33% of the exposure-weighted average risk weights applied to portfolios of retail exposures secured by residential property in Belgium for banks using the IRB approach. France used Article 458 of CRR to tighten the limit on large exposures, which should not exceed 5% of capital for highly indebted large non-financial corporations established in France. Sweden imposed a 25% limit on risk weights for portfolios of retail exposures secured by property vis-à-vis borrowers resident or established in Sweden for banks using the IRB approach.

risks associated with the systemic importance of banks in the way the CNB does now.[110] For these purposes, it will only be possible to use the O-SII buffer or the global systemically important institutions buffer. The CNB opposed this change. At international fora, it has long pointed out that the use of the SRB instead of the O-SII in many EU countries is due to the fact that the O-SII buffer rate is capped by law at 2% of risk-weighted exposures. The regulatory package contains a change in the O-SII buffer cap. In the case of subsidiary banks, the buffer will be limited by the O-SII rate for the parent bank, or 1% where no rate is set for the parent bank.[111] This threshold would apply to all domestic systemically important institutions that currently have a non-zero SRB, and according to the CNB's analyses it might not be sufficient to cover the related risks.[112] The CNB will therefore continue to examine how to cover risks associated with the systemic importance of domestic banks beyond the O-SII buffer.

The option of newly using the SRB also for sectoral exposures (different rates for different sectors) is a legislative change intended to strengthen the resilience of banks to systemic risks in a more targeted way.[113] This specifically concerns exposures to the residential property, commercial property, non-financial corporations and household sectors. In addition, it will be possible to apply the sectoral SRB to only some banking sector institutions. The flexibility of this buffer should also be enhanced by the removal of the restriction on its use to long-term non-cyclical systemic risks only. This means it could newly react to cyclical risks where such risks cannot be mitigated by the CCyB or where the across-the-board effect of the CCyB requires a different approach to be considered. The SRB and O-SII buffers will be summable to 5%. A higher limit will also be possible subject to approval by the Commission, the ESRB and the EBA. The EBA in cooperation with the ESRB will prepare a methodology for setting the new form of the SRB. The CNB will assess it and take it into account where appropriate in its own practice. The above regulatory changes are expected to take effect in Czech law in January 2021. In the meantime, the CNB will disclose any changes made to its approaches in connection with the new legislation.

110 Besides the CNB, the Danish central bank applies the SRB in this way. Information on the SRB rate in the Czech Republic is available on the CNB website: https://www.cnb.cz/en/financial-stability/macroprudential-policy/the-systemic-risk-buffer/.

111 In the case of parent banks, the O-SII buffer will be capped at 3%, with the possibility of an increase subject to approval by the ESRB, the EBA and the Commission.

112 For details see Skořepa, M., Seidler, J. (2013). *An Additional Capital Requirement Based on the Domestic Systemic Importance of a Bank*. International Journal of Economic Series, Vol II, No 3, pp. 131–142.

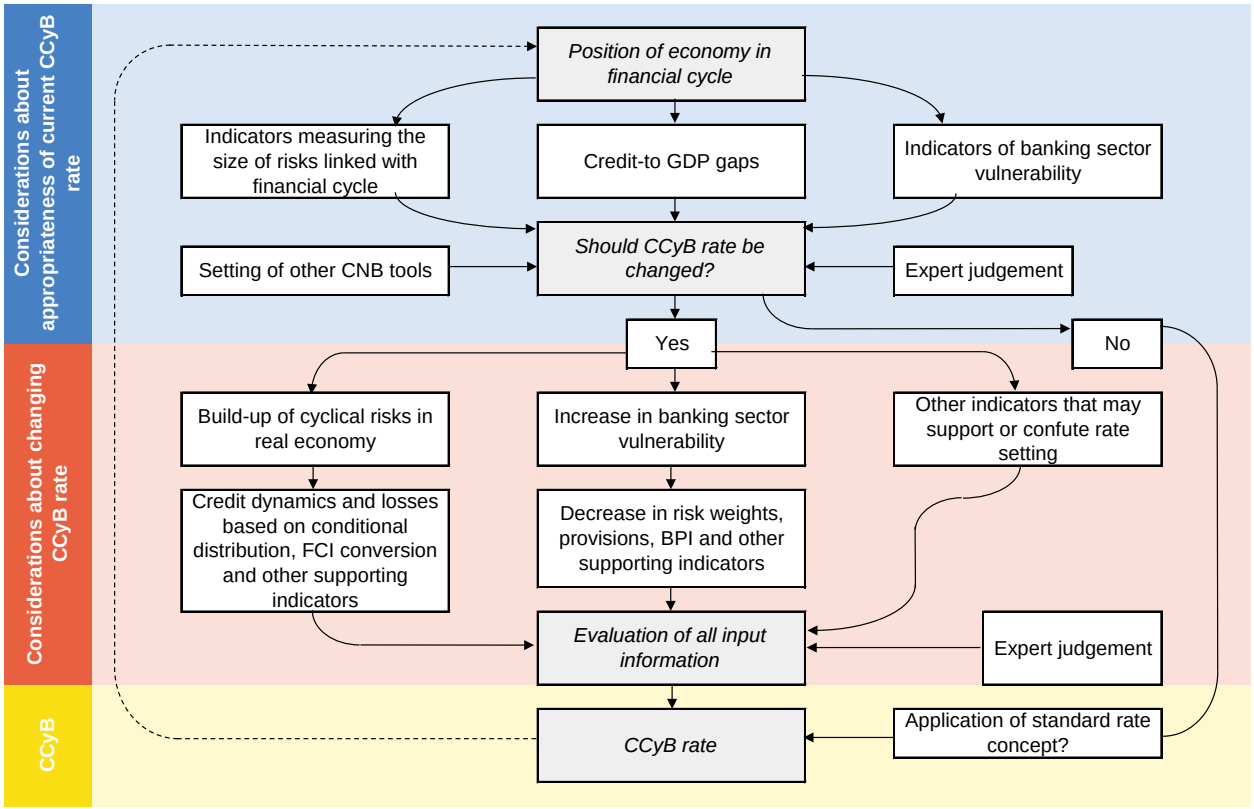
113 The current use is based on total exposures, making the application of the buffer to selected exposures relatively complicated. So far the buffer has been applied in this way only to a very limited extent in practice.

5.2 THE COUNTERCYCLICAL CAPITAL BUFFER

The countercyclical capital buffer (CCyB) is designed to increase the resilience of the financial system to risks associated with the effect of the financial cycle. One of the manifestations of an expansionary phase of the cycle in the real economy is higher cyclical risk-taking, accompanied by strong credit growth, growth in debt and a very low default rate. In the event of a downturn in the financial cycle, accumulated risks may materialise and credit losses may increase, affecting banks' capital. Another feature of an upward phase of the financial cycle is growth in the banking sector's vulnerability due to cyclically low provisioning and/or decreasing risk weights. An economic downswing results in them returning to higher levels and potentially also in a need to top up capital so that the capital requirement can continue to be met once risk-weighted assets increase. The optimum CCyB rate is supposed to eliminate the negative impacts of all these manifestations of the financial cycle on the banking sector, prevent further transmission of the shock to the economy and maintain the supply of bank credit. For these reasons, the CNB sets the CCyB rate based on a comprehensive assessment of indicators of the financial cycle and the vulnerability of the banking sector and other factors affecting the sector's resilience (see Figure V.1).[114]

Figure V.1

The CNB's approach to setting the CCyB rate



Source: CNB

114 The main part of the CNB's approach to the countercyclical capital buffer in the Czech Republic and the decision-making process from the assessment of the position of the economy in the financial cycle through to the setting of the buffer rate are described in Hájek, J., Frait, J., Plašil, M. (2017): *The Countercyclical Capital Buffer in the Czech Republic*, thematic article, FSR 2016/2017.

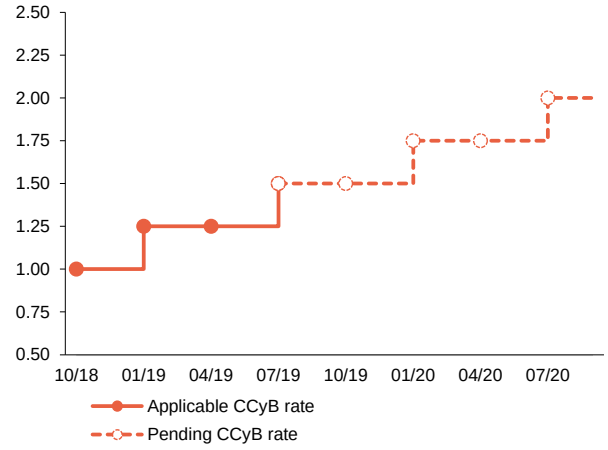
The CNB decided to increase the countercyclical capital buffer rate to 2.00% with effect from July 2020

The CNB Bank Board decided at its meeting on 23 May 2019 to increase the CCyB rate to 2.00% with effect from 1 July 2020 (see Chart V.1).[115] When making its decision, it took into account the indicators and analyses presented below, taking particular note of those serving to assess shifts in the financial cycle and their impacts on potential credit losses and those reflecting the vulnerability of the banking sector (see Table V.3). The Bank Board agreed that the domestic economy was probably close to the peak of the financial cycle and the likelihood of a further increase in the countercyclical capital buffer rate had thus decreased significantly.

Chart V.1

Applicable and pending CCyB rate in the Czech Republic

(% of total risk exposure)



Source: CNB

Table V.3

Indicators of the financial cycle and the vulnerability of the banking sector

(year-on-year change)

Financial cycle		Bank vulnerability	
Indicator	Change	Indicator	Change
FCI	↑	Change in risk weights	↓
Credit growth	↑	Loan provisions	↓
Potential cyclical losses of banks	↑		
Risk characteristics of loans provided*	↑		

Source: CNB

Note: The table summarises some of the indicators used to set the countercyclical capital buffer rate. The direction of the arrow indicates the change in the indicator (arrow up means an increase, arrow down means a decrease). The shading of the arrow indicates whether the change implies high risks (red) or low risks (green). * This indicator includes data from the course of 2018 for data reasons.

The financial cycle indicator increased and was driven mainly by developments in the household sector

The aggregate financial cycle indicator (FCI) serves as a starting point for assessing shifts in the cycle. It rose further in 2018 Q4, reaching levels close to 0.18 (see Chart V.2). Its growth was driven by strong credit growth in the household sector (especially for loans for house purchase) and a related rise in residential property prices. Growth in the FCI was also fostered by low interest rate spreads and an increase in corporate indebtedness (see section 2.2).[116]

Growth in bank loans remains strong across the main credit segments…

Year-on-year growth in loans to the private non-financial sector has been stable at 6%–8% since the start of the expansionary phase of the financial cycle (2015 Q4). Their total volume rose by 6.7% in 2019 Q1 (see Chart V.3). The growth rate increased in the case of loans to non-financial corporations and households for consumption, standing above its historical averages in both segments (see Chart V.4). Loans for house purchase recorded a slight slowdown, reflecting the subsiding effect of frontloading before the DTI and DSTI limits took effect. However, the rate of growth of loans to households for house purchase remained above-average in the medium-term and long-term contexts.

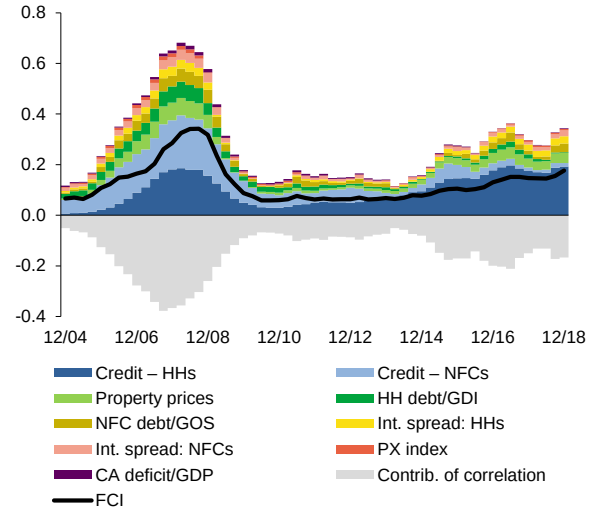
115 The history of previous CCyB rate decisions is available at: https://www.cnb.cz/en/financial-stability/macroprudential-policy/the-countercyclical-capital-buffer/.

116 The FCI methodology is described in Plašil, M., Seidler, J., Hlaváč, P. (2016): *A New Measure of the Financial Cycle: Application to the Czech Republic*, Eastern European Economics, 54(4).

Chart V.2

Financial cycle indicator and its decomposition

(0 minimum, 1 maximum)



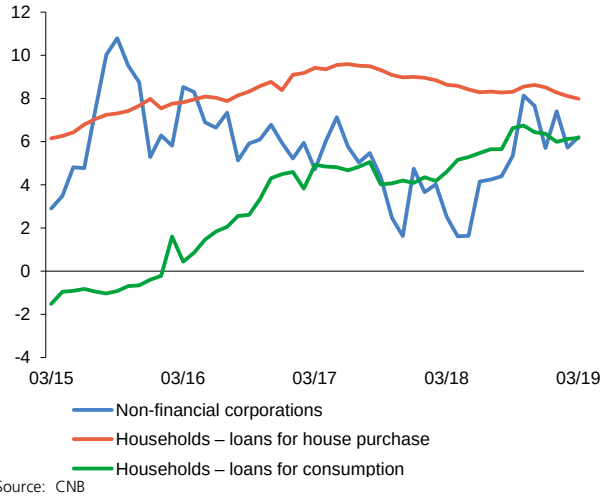
Source: CNB

Note: GDI denotes gross disposable income of households, GOS stands for gross operating surplus of non-financial corporations. The interest spread is the difference between the client rate on new loans and the 3M PRIBOR. The negative contribution of the cross-correlation structure to the FCI value (the loss due to imperfect correlation of the subindicators) is due to the difference between the current FCI value and the upper bound, which assumes perfect correlation between all indicators. Weak correlation between the subindicators is reflected in growth in the negative contribution to the overall FCI value. The FCI methodology is described in Plašil, M., Seidler, J., Hlaváč, P. (2016): A New Measure of the Financial Cycle: Application to the Czech Republic, Eastern European Economics, 54(4).

Chart V.3

Year-on-year growth in bank loans to the private non-financial sector

(%)



Source: CNB

…genuinely new bank loans were volatile in late 2018 and early 2019

The volume of genuinely new[117] bank loans to the household sector rose by 9.4% year on year in 2018 H2. Conversely, it decreased by 16.3% in 2019 Q1 (see Chart V.5). This was fostered by frontloading before the new *Recommendation on the management of risks associated with the provision of retail loans secured by residential property* of 12 June 2018 entered into force.[118] The frontloading effect also resulted in the provision of a relatively large volume of loans with highly risky characteristics, especially mortgage loans with high DTI and DSTI ratios (see section 5.3.1, Chart V.17, Chart V.18 and section 4.3). However, a partial increase in risky characteristics was also observed for loans to finance the purchase and construction of commercial property, where an increase in loans with high LTV ratios and low DSCR was recorded (see section 5.3.2), and partly also for loans to non-financial corporations, which showed volatility. They decreased in volume by 6% in 2018 H2, while increasing by 8.7% in 2019 Q1. The creditworthiness of individual non-financial corporations may have been partially worsened by macroeconomic developments leading to a fall in profitability in this sector and a rise in the number of loss-making firms (see section 2.2).

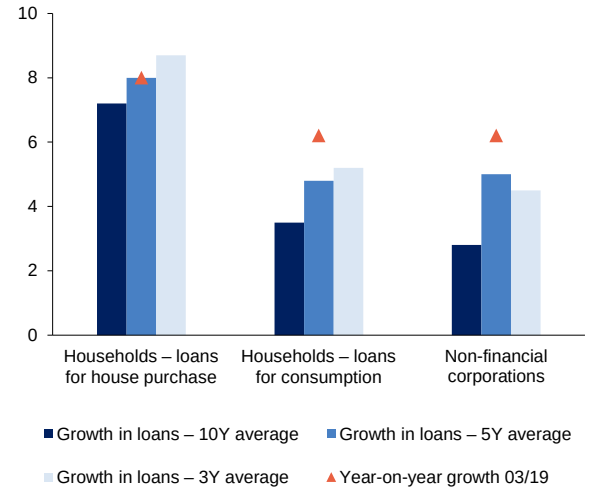
117 Genuinely new loans are adjusted for refinanced and refixed loans.

118 https://www.cnb.cz/export/sites/cnb/cs/legislativa/.galleries/Vestnik-CNB/2018/vestnik_2018_08_21018180.pdf.

Chart V.4

Average and current growth in bank loans to the private non-financial sector

(%)

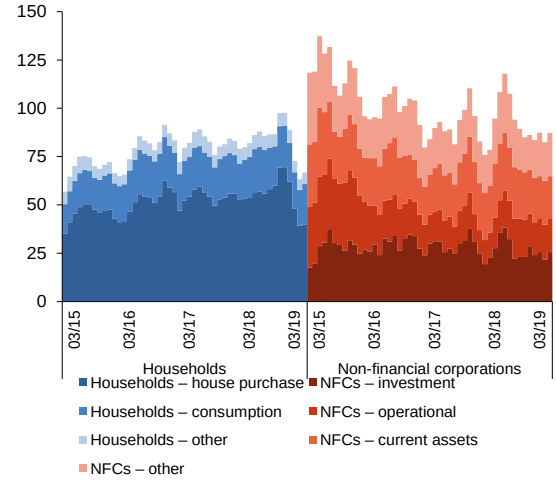


Source: CNB

Chart V.5

Amounts of genuinely new bank loans to the private non-financial sector

(three-month totals in CZK billions)



Source: CNB
Note: Genuinely new loans include increases in existing loans and are adjusted for refinanced and refixed loans.

The shift of the Czech economy into the growth phase of the financial cycle continued in 2018

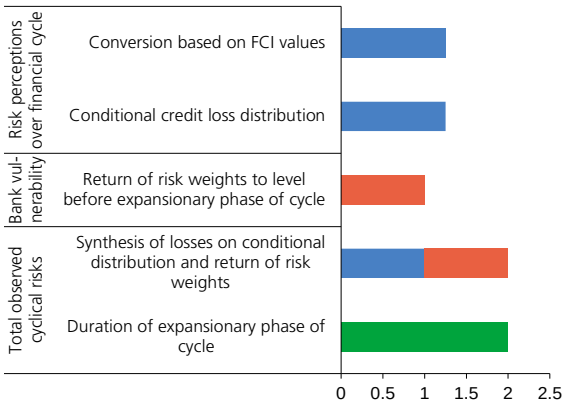
Persisting strong credit growth and continued growth in the FCI suggest that the domestic economy moved further into the growth phase of the financial cycle. It thus entered the fourth year of the expansionary phase at the end of 2018. Sustained easy financial conditions remain an important factor fostering a further shift of the domestic economy in the financial cycle. The perceived real costs of debt[119] for new loans to households for house purchase are still very negative (-4.4% as of 31 December 2018). Real interest rates adjusted for inflation expectations as measured by the CPI index were also very low (see Chart II.8). The environment of low interest rates and strong wage growth encouraged increased drawdown of loans by the household sector. This was reflected in continued growth in property prices, which were overvalued by around 15% according to the CNB's analyses (see Chart II.13 and section 2.1). Conditions were thus still in place for a spiral between property price growth and an increasing level of debt, to which the CNB had responded earlier with macroprudential measures (see section 5.3.1 and Chart V.13).

The expansionary phase of the financial cycle implies higher build up of cyclical risks and growth in potential future losses

These manifestations point to higher cyclical risk-taking, which may result in the domestic banking sector incurring higher credit losses if economic conditions deteriorate. The prudential estimate of these losses of CZK 26.4 billion (i.e. 1.06% of risk-weighted assets) would be covered by a CCyB rate of around 1.25%[120] (see Table V.4, conditional credit loss distribution). An indicative conversion of the values of the FCI leads to the same conclusion (see Table V.4 and Table V.1 CB). However, the values of the CCyB rate obtained in this manner cannot be interpreted mechanistically. The conditional credit loss distribution and the FCI primarily provide information about the absolute size of banks' potential credit losses and do not cover the aspects of the financial cycle that affect the banking sector's vulnerability and impact on risk weights. Both these facts should be taken into account when deciding on the CCyB rate.

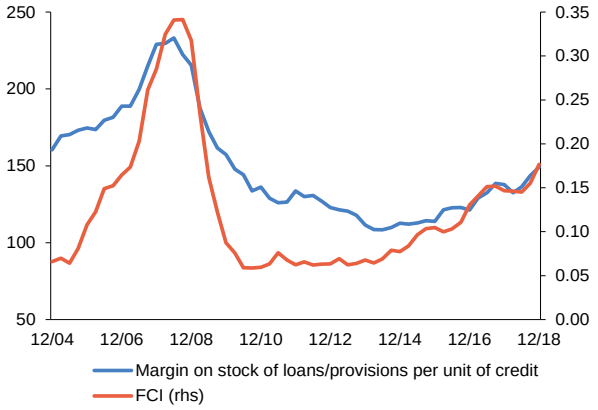
119 Perceived real debt servicing costs are nominal client rates adjusted for wage growth.
120 Implied losses of CZK 26.4 billion correspond to 1.06% of risk-weighted assets. The nearest possible CCyB rate that fully covers the implied losses is 1.25%, as the CCyB rate is rounded up to the nearest quarter of a per cent.

Table V.4
CCyB rate covering various effects of the financial cycle
(% of total risk exposure)



Source: CNB
Note: Risks observed as of 12/2018.

Chart V.6
Ratio of the interest rate margin to provisions and the FCI
(%; right-hand scale: 0 minimum, 1 maximum)



Source: CNB
Note: The margin on the stock of loans is the difference between the client lending rate and the client deposit rate.

The current phase of the financial cycle is reflected in exceptionally low impairment losses and an optimistic perception of the degree of credit risk undertaken…

Favourable economic conditions are usually reflected in rising vulnerability of the banking sector. One of the representative indicators for describing the risks associated with cyclicality in the banking sector is the ratio of the margin on the stock of loans to provisions per unit of credit.[121] This ratio increased further during 2018, which may indicate greater sensitivity to a deterioration in economic conditions (see Chart V.6). Another manifestation of the upward phase of the financial cycle is the very low default rate of banks' clients and the related almost zero asset impairment losses during 2018 (see Chart V.7). The ratio of provisions to total loans recorded a one-off increase after the switch to the new IFRS 9 accounting standard but resumed its downward trend in the rest of 2018 and was lower at the end of 2018 than a year earlier (see Chart V.2 CB).

…and is affecting the outcomes of banks' risk models, thereby contributing to a decline in risk weights

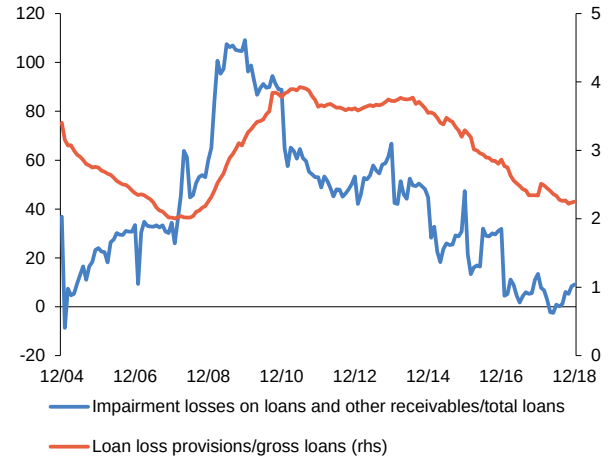
The favourable cyclical developments are being reflected in the calibrations and results of banks' risk models.[122] The risk weights for the main IRB portfolios have been decreasing constantly since the expansionary phase of the financial cycle started (see Chart V.8).[123] The observed decline and the resulting lower volume of risk-weighted assets may mean that the banking sector's assessment of risks is over-optimistic on the aggregate level.[124] A deterioration in the economic conditions accompanied by an increase in the default rate would lead to risk weights gradually returning to higher levels. In order to comply with the currently applicable capital requirement,[125] this would imply a need to top up additional capital. Based on the risk weights observed at the beginning of the expansionary phase of the financial cycle, the capital requirement for IRB credit portfolios would be CZK 24.3 billion higher in absolute terms than its actual level at the end of 2018 (see Chart V.9).

121 The indicator's construction, properties and relevance to CCyB rate decisions are discussed in Pfeifer, L., Hodula, M. (2018): *A Profit-to-Provisioning Approach to Setting the Countercyclical Capital Buffer: The Czech Example*, CNB Working Paper 5/2018, Czech National Bank.
122 For details on the risk of procyclicality of risk weights under the IRB approach, see Brož, V., Pfeifer, L., Kolcunová, D. (2018): *The Pro-Cyclicality of Risk Weights for Credit Exposures in the Czech Republic*, CNB WP 12/2018, Malovaná, S., Kolcunová, D., Brož, V., (2017): *Does Monetary Policy Influence Banks' Perception of Risks?* CNB WP 9/2017 and Brož, V., Pfeifer, L., Kolcunová, D. (2017): *Are the Risk Weights of Banks in the Czech Republic Procyclical? Evidence from Wavelet Analysis*, CNB WP 15/2017.
123 Between December 2015 and December 2018, the average risk weight on loans to corporations decreased by around 5.7 pp, that on retail loans secured by residential property by 5.2 pp and that on other retail loans by 7.2 pp.
124 Risk weights can be affected by other factors in addition to the financial cycle, such as change in collateral quality, enhanced risk management processes and macroprudential measures taken.
125 In percentage terms.

Chart V.7

Asset impairment losses and loan loss provisions

(bp; right-hand scale: %)

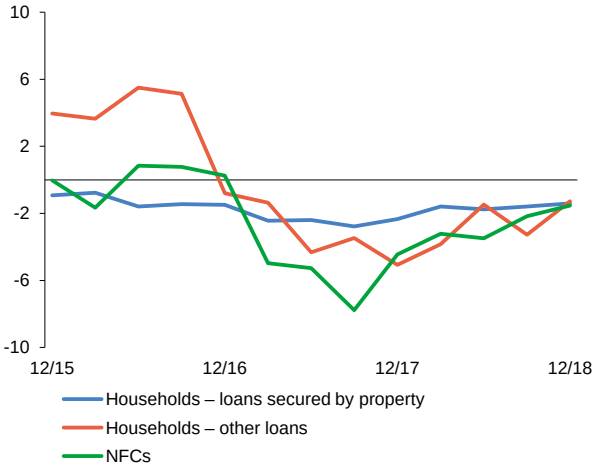


Source: CNB
Note: Impairment losses are the ratio of growth in net impaired loans to total bank loans.

Chart V.8

Year-on-year change in IRB risk weights in the main loan categories

(pp)



Source: CNB

The new IFRS 9 accounting standard is likely to lead to unintended procyclical behaviour of banks

One of the implications of the IFRS 9 accounting standard is an additional source of banking sector vulnerability. IFRS 9 is supposed to be beneficial to financial stability from the long-term perspective, because unlike the previous IAS 39 standard it allows for early and sufficient loan loss provisioning. However, the results of the macro stress tests of banks published in the CNB's Financial Stability Reports (for details see FSR 2017/2018) support the view that IFRS 9 may have a cliff effect in the form of a rapid and sharp pass-through of an adverse situation to capital in certain conditions.

The CCyB rate should respond to potential credit losses and banks' vulnerability

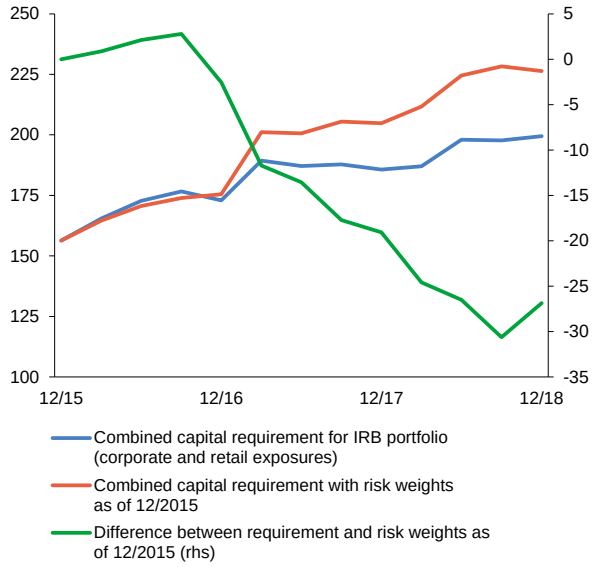
The CCyB should ensure that the banking sector is sufficiently resilient to all the risks associated with the expansionary phase of the financial cycle. When deciding on the rate, it is therefore desirable to take into account both the potential credit losses arising from excessive credit growth and the cyclical development of risk weights and other signs of rising vulnerability of the banking sector. The quantification of the first effect corresponded to the losses implied by the conditional credit loss distribution at the end of 2018, which amounted to around CZK 26.4 billion (i.e. 1.06% of risk-weighted assets). The quantification of the second effect is based on the absolute increase in the capital requirement due to the return of risk weights on loan portfolios under the IRB approach to the level observed at the start of the expansionary phase of the financial cycle.[126] This increase is around CZK 24.3 billion (i.e. 0.98% of risk-weighted assets). The simple sum of these effects (2.04%) has to be adjusted for the volume of exposures in default from the conditional credit distribution, for which the effect of change in risk weights is not considered (i.e. CZK 0.7 billion, or 0.05%). The resulting effect implies a need for around CZK 50 billion of capital, which the CCyB rate should cover. This amount of capital represents 1.99% of the value of risk-weighted assets as of the end of 2018 (CZK 2,514 billion), implying a CCyB rate of 2.00% (see Table V.4 and Chart V.10). This figure is in line with the simplest quantitative rule taking into account the duration of the financial cycle. Under this rule, the CCyB rate should go up by 0.25% for each semester of the expansionary phase of the financial cycle. The domestic economy is currently in the eighth semester of the expansionary phase of the financial cycle, which equates to a rate of 2.00% under this rule (see Table V.5).

126 The economy entered the expansionary phase of the financial cycle in 2015 Q4.

Chart V.9

Actual and hypothetical capital requirements based on the application of risk weights from 12/2015

(CZK billions)

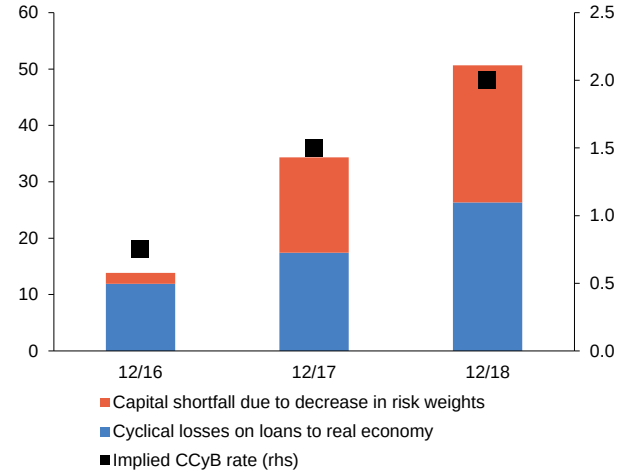


Source: CNB
Note: This is the capital requirement for the IRB loan portfolio of the private sector. The hypothetical capital requirement is calculated on the basis of risk weights as of the beginning of the expansionary phase of the financial cycle (12/2015).

Chart V.10

Quantification of cyclical losses and banking sector vulnerability and the corresponding CCyB rate

(CZK billions; right-hand scale: % of total risk-weighted assets)



Source: CNB

According to the CNB, the standard CCyB rate for covering the usual level of cyclical risks is 1%

In previous publications, the CNB has emphasised that it prefers to act with a high degree of prudence in deciding on the CCyB rate and to set a non-zero CCyB rate when cyclical financial risks are still close to their usual, standard levels and have not yet become significantly elevated. The aim of the standard rate concept is to ensure that the banking sector's resilience starts to be supported in a timely manner after the acute phase of a cyclical contraction, or even a financial crisis, has subsided. The CNB's detailed approach to setting and calibrating the standard CCyB rate is described in the thematic article on financial stability 2/2019.[127] According to the current assessment, cyclical risks have reached elevated levels, corresponding to a need to set the CCyB rate above the standard level. The concept described will therefore no longer affect the setting of the CCyB rate during the current financial cycle but should be applied in the early expansionary phase of the new cycle.

Materialisation of cyclical risks and growing tensions in financial markets will be the key signal to lower the CCyB rate

The CNB stands ready to lower or completely zero the CCyB rate in the event of a sudden turnaround in the financial cycle. However, a gradual decrease in lending activity or more prudential lending will not constitute a reason for lowering the CCyB rate, as the cyclical risk assumed at times of above-average credit growth and relaxed credit standards stays in banks' balance sheets. The quantitative approaches used as a guide for setting rates cannot be relied on to reduce the CCyB rate either,

127 Plašil, M. (2019): *The Countercyclical Capital Buffer Rate for Covering the Usual Level of Cyclical Risks in the Czech Republic*, thematic article on financial stability 2/2019, CNB.

because they are primarily used when deciding on rate increases. Clear signals of increased risk materialisation, reflected in rising risk weights, growing costs of risk and increased provisioning, will thus be grounds for reducing the CCyB rate.[128] On the other hand, a weakening credit supply will be an important factor when deciding to release the buffer. Indicators of stress in financial markets (such as the CISS indicator[129] for the Czech economy or money market rate spreads) may be a leading or coincident signal of this. The process of lowering the CCyB rate must be optimally timed, as a very early reduction would increase the banking sector's capital surplus, which might not be used prudently to cover future losses and the draining of which might further increase the sector's vulnerability. Conversely, releasing the buffer too late could result in a credit crunch and would render it impossible to smooth the downward phase of the financial cycle.

Deviations of the credit-to-GDP ratio from its trend do not provide a suitable guide to increasing or releasing the CCyB for the Czech Republic

In accordance with an ESRB recommendation,[130] the CNB should take into account the credit-to-GDP ratio and its deviation from the long-term trend when determining the position in the financial cycle and deciding on the CCyB rate. In 2018 Q4, the ratio was 89.3% and the relevant gap 2.4 pp. The CNB has long maintained that this approach is not a suitable tool for assessing cyclical risks in the Czech economy and is subject to a range of shortcomings which reduce its reliability.[131] The additional gap (the expansionary credit gap), which uses an alternative approach to determining the long-term trend and partially eliminates the problems associated with the recommended methodology, was 1.4 pp (see Chart V.3 CB).[132] However, this indicator must be also viewed as only a very rough way of assessing the position in the financial cycle, with limited direct usefulness as regards deciding on the CCyB rate.

128 The results of the macro stress test of banks indicated that the CCyB would be fully used to absorb the shock to banks' capital in the event of particularly adverse economic developments (see section 4.1).

129 Its construction method is based on Holló et al. (2012): *CISS – A Composite Indicator of Systemic Stress in the Financial System*, ECB working paper series.

130 European Systemic Risk Board: Recommendation (ESRB/2014/1) on guidance to EU Member States for setting countercyclical capital buffer rates, January 2014.

131 It was published regularly in previous Financial Stability Reports. For a more detailed explanation see also the thematic article Geršl, A., Seidler, J.: *Excessive Credit Growth as an Indicator of Financial (In)Stability and its Use in Macroprudential Policy* in FSR 2010/2011.

132 More detailed methodological information about the additional gap can be found in the thematic article *The Countercyclical Capital Buffer in the Czech Republic* published in FSR 2016/2017.

5.3 RISKS ASSOCIATED WITH PROPERTY MARKETS

5.3.1 Risks Associated with Residential Property Markets

The CNB evaluates risks associated with the property market on an ongoing basis…

Previous *Financial Stability Reports* identified a spiral between credit financing of property purchases and rapidly rising property prices as a significant source of systemic risk in the domestic economy. The CNB evaluates the level of these risks on an ongoing basis and responds to them where necessary by applying macroprudential tools and microprudential supervision.[133] This approach is based on the set of rules contained in the Official Information *Recommendation on the management of risks associated with the provision of retail loans secured by residential property* (the "Recommendation"). The Recommendation sets quantitative limits on some mortgage loan indicators and qualitative criteria for the prudential provision of such loans.[134] With effect from October 2018, the Recommendation was extended to include caps on the debt-to-income (DTI) and debt service-to-income (DSTI) ratios. This prevents selected groups of the population becoming overindebted and aligns the process of assessing the income situation of loan applicants across domestic banks.

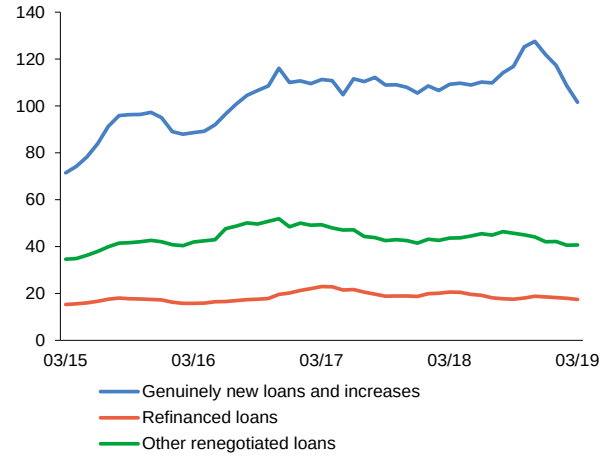
…and monitors compliance with the recommended limits

In addition to regularly assessing the property market situation, the CNB is paying increased attention to growth in, and risk characteristics of, housing loans. The main source of information for the aggregate analyses is the semi-annual *Survey of loans secured by residential property* (the "Survey"). It enables the CNB to check compliance with the recommended limits on selected indicators thanks to detailed information on individual loans. However, it also provides a whole range of other information necessary for optimally configuring macroprudential instruments. Following the introduction of the DTI and DSTI caps, the Survey for 2018 H2 was extended to include data on total debt and debt service relative to clients' incomes and other data allowing for more refined analyses (the purpose of mortgage loans, for example).

Chart V.11

Six-month totals of components of new loans for house purchase

(CZK billions; moving six-month totals)

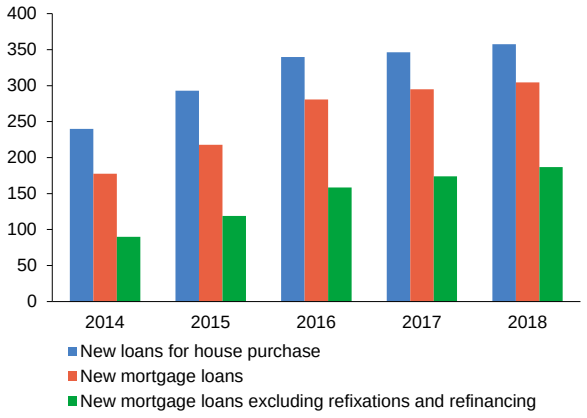


Source: CNB

Chart V.12

New housing loans and mortgage loans

(annual totals in CZK billions)



Source: CNB

133 Supervisory benchmark 1/2017 of November 2017 on the provision of loans to households by credit institutions.
134 Some quantitative limits were incorporated into the draft amendment to the Act on the CNB that is currently in the legislative process.

Banks provided a record amount of housing loans in 2018

Genuinely new loans (excluding refinancing and refixations) increased gradually in 2018 H1 and then picked up significantly (see Chart V.11). This was due to a media campaign reflected in efforts to obtain loans in the months just before the DTI and DSTI caps were introduced. Drawings of new housing loans slowed at the year-end. However, their total amount for 2018 as a whole remained at a record high (CZK 232 billion, of which CZK 187 billion in mortgage loans; see Chart V.12). Weakening credit growth was also observed in the first few months of 2019. The observed decline was due in part to exhaustion of credit market capacity as a result of frontloading. However, a tightening of conditions caused by the introduction of the DTI and DSTI caps, growth in client interest rates[135] and worsening housing affordability owing to a rapid rise in property prices also played a role.

The setting of DTI and DSTI caps led to a fluctuation in the provision of mortgage loans

The CNB stated in December 2018 that less than 9% of loans provided would have had LTIs of over 9 or LSTIs of over 45% in 2018 H1 and that the share of such loans would very likely have been higher if clients' other debts had been taken into account in the DTI and DSTI data. The true impact of the DTI and DSTI caps on the amount of mortgage loans provided cannot be assessed at the moment. In 2018 Q3 and Q4, the volume of genuinely new mortgage loans was CZK 7 billion and CZK 8 billion higher respectively than the average since 2015 (CZK 41.5 billion). In 2019 Q1, by contrast, it was CZK 9 billion lower. Given the simultaneous introduction of the DTI and DSTI caps and the growth in property prices and interest rates on housing loans, the impact of each of these factors cannot be fully identified. The CNB expects the above factors, combined with the effect of last year's base, to foster a drop in new mortgage loans in 2019 as a whole. As the monthly volumes of genuinely new mortgage loans provided in March and April 2019 were just CZK 1 billion lower than the monthly average since 2018 (CZK 13.8 billion), the full-year decline should not be significant.

Favourable conditions for a spiral between housing loans and property prices persist…

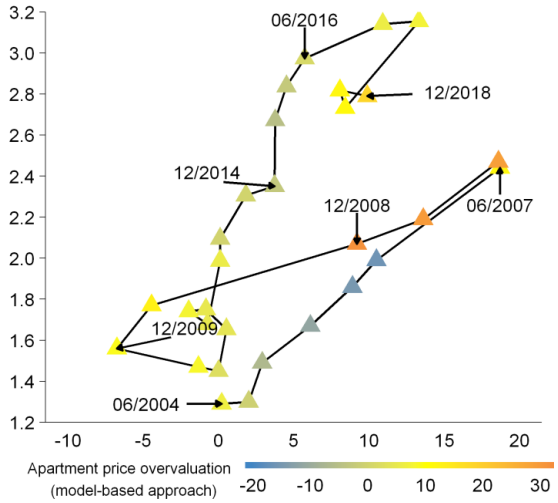
The high demand for housing loans was reflected in renewed rise in property price inflation in 2018 H2 (see section 2.1). The spiral between credit financing of property purchases and optimistic expectations of a future rise in the value of property thus started to intensify slightly again after having slowed in the previous quarters (see Chart V.13). The financial conditions for purchasing property remain favourable, boosting the attractiveness of investing in housing. A renewed movement down the spiral in the rest of 2019 cannot be ruled out, but conditions for the spiral to escalate will probably persist in the medium term.

135 Although client interest rates increased only slightly and the conditions for financing property on credit remain favourable, growth in households' borrowing capacity – indicating the size of a safely repayable loan – halted at the end of 2018. If the CNB's macroeconomic forecast (Inflation Report, May 2019) materialises for household income and interest rates, borrowing capacity should decline slightly in 2019. This could lead to some weakening of demand for housing loans and a drop in total loans drawn.

Chart V.13

Spiral between apartment price growth and new loans for house purchase in relation to the level of wages

(x-axis: y-o-y growth in apartment transaction prices in %; y-axis: new loans in relation to wages)

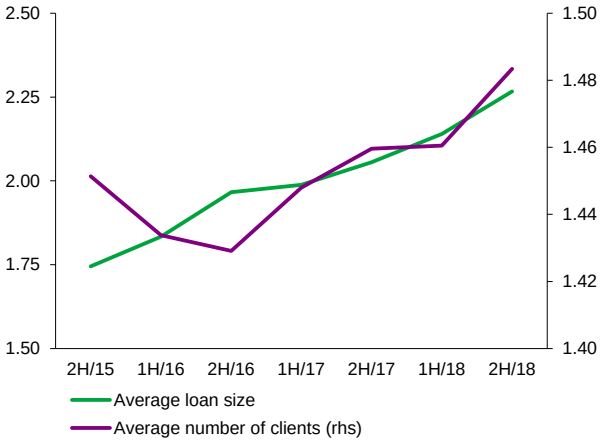


Source: CNB
Note: The spiral is derived on the basis of apartment price growth and the amount of new loans for house purchase in relation to the level of wages.

Chart V.14

Average mortgage loan size and number of declared incomes according to the Survey

(CZK millions; right-hand scale: number of persons)



Source: CNB

…and according to the Survey the average loan size provided also rose in line with the growth in property prices

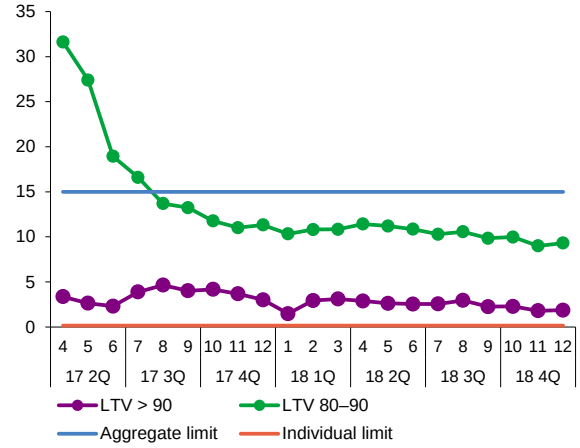
The rising property prices led to a corresponding increase in the average size of loans provided for house purchase (see Chart V.14). This growth exceeded the growth in net incomes (see section 4.3). Given the introduction of recommended DTI and DSTI caps, households partly responded to this growth by increasing the average number of clients per loan application (see Chart V.14). The median value of total debt taking additional debt into account reached around CZK 2.3 million in 2018 H2.[136] Clients with the median debt included households with both high and relatively low incomes: around half of the applicants declared a net income of below CZK 35,000 (see Chart V.4 CB). Due to the potentially high sensitivity of a large proportion of clients to changes in economic conditions (see section 4.3), it is vital, in the interests of financial stability, to carefully assess the risk characteristics of loans provided and monitor whether the recommended limits are being circumvented.

Compliance with the recommended LTV limits remained satisfactory overall…

Data from the Survey for 2018 H2 indicate that banks were broadly compliant with the recommendation in force as regards LTV limits. The share of loans with LTVs of 80%–90%, which can account for a maximum of 15% of new loans, decreased slightly further, reaching 9% in December 2018 (see Chart V.15). Banks were thus compliant with the aggregate limit by a sufficient margin. Riskier loans continued to be moved into the 70%–80% LTV category and also into lower categories (see Chart V.16). As in the previous period, banks provided some loans with an individual LTV limit of over 90%, the level above which loans should not be provided under the Recommendation. However, the total share of these loans remained low, falling below 2% of new loans in 2018 Q4. Overall, compliance with the recommended limits thus improved further.

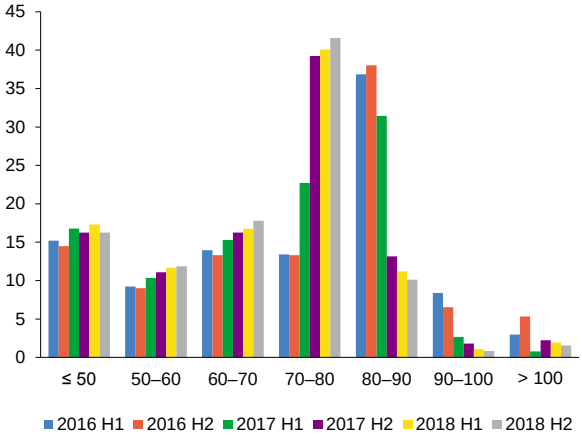
136 The client's average total debt was CZK 3 million and the most frequent amount (mode) was CZK 2 million (see Chart V.4 CB and Chart V.5 CB). In addition to the mortgage loan itself, the total debt takes consumer credit, mortgage loans taken out earlier and any other revolving loans and credit lines into account.

Chart V.15
Fulfilment of the recommended LTV limits
(share of loans in volume provided in %)



Source: CNB

Chart V.16
LTV distribution of new loans
(x-axis: LTV in %; y-axis: share of loans in volume in %)



Source: CNB
Note: Interval closed from the right.

...but the CNB will continue to pay increased attention to compliance with the limits and monitor any circumvention tendencies

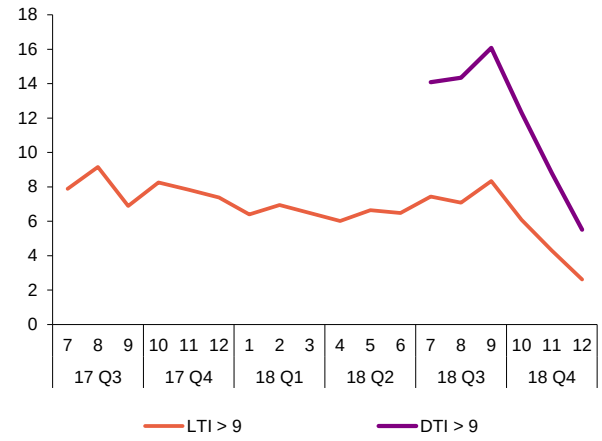
Although most credit institutions are compliant with the recommended LTV limits, some tendencies identified on the basis of the data from the Survey may indicate that in good times lenders have a natural tendency to value collateral on the basis of current market prices, regardless of the fact that those prices may be overvalued in an upward phase of the cycle (see section 2.1). The Survey revealed that almost 17.5% of loans had an LTV ratio exactly equal to the aggregate 80% limit and 4.5% of loans had an LTV ratio exactly equal to the individual 90% limit (see Chart V.6 CB). These results may indicate optimisation of loan size (adjustment of the numerator of the LTV ratio) or of collateral value (adjustment of the denominator of the LTV ratio). The CNB will therefore assess the prudential collateral valuation process[137] in order to prevent any circumvention of the limits using approaches that do not conform to the Recommendation. Another aspect will be continued monitoring of concurrent provision of unsecured loans and mortgage loans aimed at circumventing the LTV limit. According to the available data, however, this practice is not going on to an increased extent (see Chart V.7 CB).

The CNB regards the current LTV limits as sufficient, but continued property price growth could require a tightening soon

Property price inflation accelerated again at the end of 2018 and the estimated overvaluation of property prices increased (see Chart II.13, section 2.1). From the financial stability perspective, this led to a weakening of the effectiveness of the LTV limits, whose current levels were already previously described by the CNB as upper bounds. The CNB does not deem it necessary to tighten the limits immediately. However, continued growth in house price overvaluation could necessitate a reassessment of the sufficiency of the current limits. The CNB therefore stands ready to reassess, if necessary, the sufficiency of the current limits and respond to a further build-up of systemic risk by tightening them.

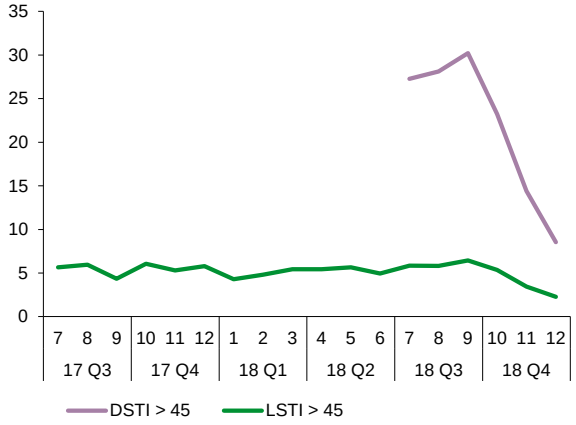
137 A potential risk to financial stability would arise if institutions did not take consistent and systematic account of cyclical developments the property market when valuing collateral.

Chart V.17
Fulfilment of the recommended DTI limits
(share of loans in volume provided in %)



Source: CNB

Chart V.18
Fulfilment of the recommended DSTI limits
(share of loans in volume provided in %)



Source: CNB

The process of adjustment to the new recommended DTI and DSTI limits is gradual. Overall, institutions did not meet them…

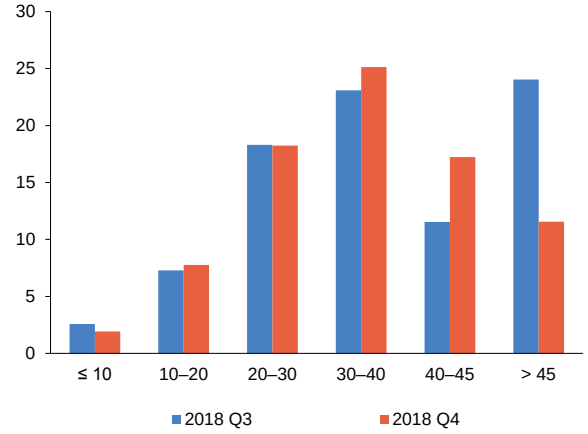
In 2018 Q3 – immediately before the recommended DTI and DSTI caps took effect – credit institutions were lending to a significant extent to clients who had high additional debt and an excessive debt service burden according to the Survey (see Chart V.17 and Chart V.18).[138] Loans provided in this period may thus be associated with high risk. Additional (mostly consumer) loans are provided at higher interest rates than mortgage loans and significantly increase debt service costs, although they usually have shorter maturities. Following the introduction of the recommended limits in October 2018, this trend was reversed and the shares of loans in excess of the limits started to decline towards the 5% exemption. However, the adjustment process has not yet been completed and institutions were non-compliant with the recommended limits overall in 2018 Q4. Institutions' compliance with the recommended limits can be described as having been particularly insufficient in October and November 2018.

…their non-compliance with the recommended limits mainly concerned the DSTI ratio…

The share of loans with a DSTI ratio of over 45% was 24% in 2018 Q3 and fell to less than 12% in Q4 (see Chart V.19). Despite the turnaround towards more prudent DSTI levels, the share of loans breaching the permitted exemption more than doubled. The quarter-on-quarter drop in the proportion of loans in excess of the limit was due mainly to the transfer of part of the loans to the DSTI category of 40%–45%. In its previous Financial Stability Reports, the CNB has also described this category as risky and recommended that institutions provide loans in this category with increased prudence. Household stress tests (see section 4.3) confirm that the provision of loans with a DSTI ratio of over 40% is associated with high risk. This conclusion applies despite some increase in client interest rates and the related reduction of the potential for them to rise suddenly and sharply in the future. The CNB will therefore require constant, highly prudent assessment of risks associated with potential growth in debt service above sustainable levels from institutions.

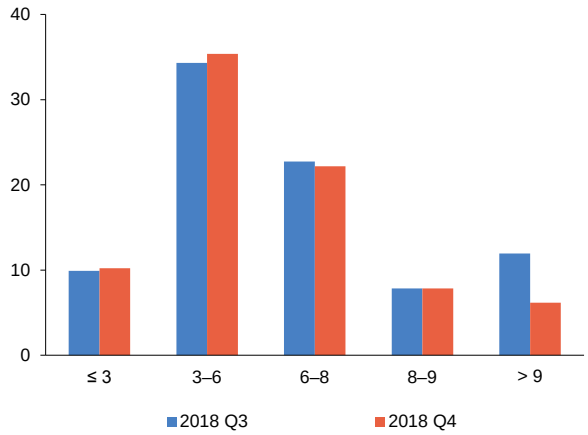
138 In the case of the LTI and LSTI ratios, the shares were close to the permitted 5% exemption (see Chart V.8 CB and Chart V.9 CB). The non-compliance with the recommended limits is thus due mainly to additional debt.

Chart V.19
DSTI distribution of new loans
(x-axis: DSTI in %; y-axis: share of loans in volume in %)



Source: CNB
Note: Relative to the volume of loans provided a quarter earlier.

Chart V.20
DTI distribution of new loans
(x-axis: DTI in years; y-axis: share of loans in volume in %)



Source: CNB
Note: Relative to the volume of loans provided a quarter earlier.

…while the share of loans in excess of the DTI limit almost adjusted to the permitted 5% exemption

The share of loans with a DTI of more than 9 also dropped following the introduction of the limits. It declined to less than 6% in 2018 Q4 (see Chart V.20). Although the 5% exemption for the provision of loans above the limit was exceeded, the observed trend can be regarded as satisfactory overall. A reduction in the supply of loans to clients with higher additional debt can be regarded as the main channel for adjustment to the recommended limits for both ratios. This is indicated by the distribution of loans according to risky LTI and LSTI levels, which remain relatively stable across the Surveys despite recording a clear fall in 2018 Q4 (see Chart V.8 CB and Chart V.9 CB). Another way of meeting the recommended limits is to increase the number of loan applicants, as their combined income will be higher (see Chart V.14).

Interest rates only partially reflected the risks undertaken in 2018 H2

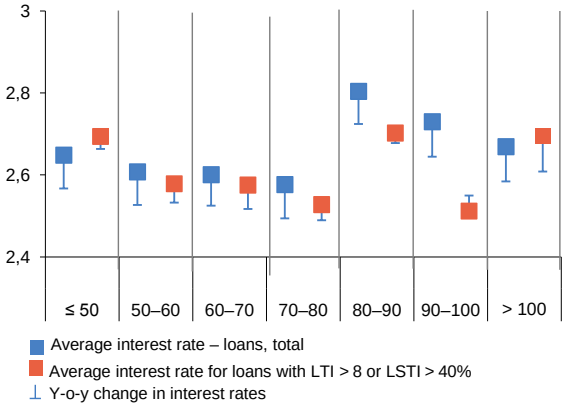
Interest rates on mortgage loans increased year on year on average, reflecting the gradual pass-through of the previous increases in monetary policy rates and developments on the government bond and interest rate swap markets (see section 2.1). Banks tried to differentiate loan rates based on the LTV ratio in 2018 H2, incorporating the level of risks particularly into rates on loans with LTVs of over 80% (see Chart V.21). The highest average interest rates were recorded in the 80%–90% LTV category, which may reflect increased client demand for this type of loans amid limited supply by lenders. Unlike the LTV parameter, banks did not seem to take the DTI and DSTI ratios into account when setting interest rates in 2018 H2. Average interest rates on loans that simultaneously had an LTI of over 8 or an LSTI of over 40%[139] were lower than those on less risky loans across all LTV categories. The lowest interest rates were recorded for loans with an LTV of 90%–100% and an LTI or LSTI exceeding the above levels. Although the frequency of these loans is not high and may include specific loan cases, the CNB will closely monitor how banks account for credit risk using corresponding risk mark-ups.

139 The LTI and LSTI ratios instead of the preferred DTI and DSTI ratios had to be taken into account for the purposes of year-on-year comparison. The levels DTI and DSTI have only been reported since the Survey for 2018 H2 and data for previous period are not available.

Chart V.21

Average interest rates by loan characteristics

(x-axis: LTV in %; y-axis: average interest rate in %)



Source: CNB
Note: Weighted average interest rates, with the sizes of individual loans as weights. Interval closed from the right.

The CNB is leaving the DTI and DSTI limits unchanged

The DSTI ratio is more restrictive for mortgage applicants and providers. Capping this ratio is crucial in a situation where interest rates on mortgage loans fall to exceptionally low levels. This occurred in the domestic economy particularly in 2016 and 2017, when average rates on new mortgages stood at around 2% or even lower. These rates started to rise in 2018, approaching 3% at the end of the year. In 2019 Q1, by contrast, they declined slightly. Owing to the growth in these rates (by more than 1 pp since the cyclical trough in 2016 and by 0.4 pp since the decision to set a DSTI cap), the potential room for them to rise sharply has been partly reduced and the risk of a surge in debt service has consequently decreased. However, the extent of this reduction is still small. This, together with insufficient compliance with the current DSTI limit of 45%, makes an increase in the cap on this ratio impossible. The CNB continues to expect lenders to be highly prudent in providing loans with DSTI ratios of between 40% and 50% given the conclusions of its analyses and household stress tests (see section 4.3). These demonstrate that loans with DSTI ratios of over 40% must be regarded as highly risky.

The CNB has made several technical changes to the Recommendation

On the basis of discussions with mortgage providers, the CNB has redefined the reference volume of loans used as the base for calculating the volume of new loans subject to exemptions from the LTV, DTI and DSTI limits. The reference volume is now one-half of the sum of all retail loans secured by residential property provided in the two previous quarters or one-half of the sum of other consumer credit not secured by residential property provided in the two previous quarters. The CNB has also clarified the provision on the refinancing of consumer credit not secured by residential property for clients who already have a retail loan secured by residential property and are simultaneously increasing the outstanding principal of the unsecured loan by more than 10% as part of the refinancing process. In such cases, lenders should always assess whether clients' total debt satisfies the recommended DTI and DSTI limits.

The CNB is seeking the statutory power to set upper limits on the LTV, DTI and DSTI ratios for mortgage loans

The CNB and the Czech Ministry of Finance have submitted into the legislative process an amendment to the Act on the CNB that would empower the CNB to set upper LTV, DTI and DSTI limits in a legally binding manner through provisions

of a general nature. All three ratios are regulated by the current Recommendation. A switch to setting these ratios in a legally binding manner will therefore have no major impact on current bank providers of these loans or on consumers. However, the limits must be legally binding in order to ensure a level playing field on the market and to prevent unfair competition between lenders in the future. In this respect, the entry of new (especially non-bank[140] and foreign) providers into this market segment would be problematic, as enforcement of the rules set out in the Recommendation would not be as effective for them as it is for domestic banks.

5.3.2 Risks Associated with Commercial Property Markets

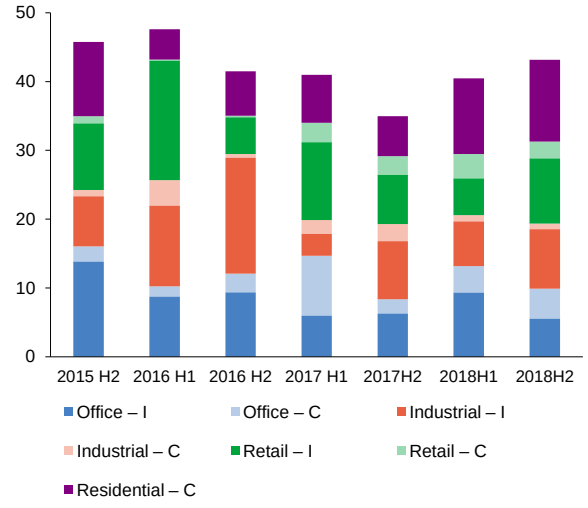
The amount of new bank loans secured by commercial property remains stable over the cycle…

New loans secured by commercial property amounted to CZK 43 billion in 2018 H2.[141] Loans for investment in office property fell slightly, while loans for investment in retail centres grew (see Chart V.22). Total loans secured by commercial property remain stable over time, fluctuating around CZK 40 billion. Unlike loans secured by residential property, the volumes provided do not respond to business and financial cycle fluctuations. Their share in banks' balances sheets is falling.

Chart V.22

Amount of new loans secured by commercial property

(CZK billions)

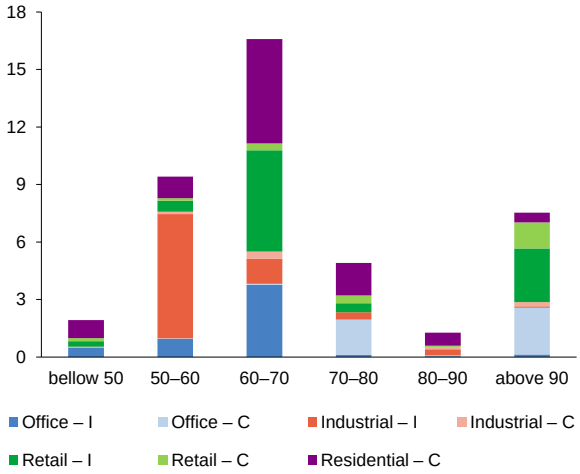


Source: CNB
Note: I: investment in existing property, C: construction.

Chart V.23

LTV distribution of new loans in 2018 H2

(x-axis: LTV in %; y-axis: CZK billions)



Source: CNB
Note: I: investment in existing property, C: construction. Interval closed from the right.

140 In European countries, most mortgage loans are provided by banks. In some of them, however, the share of non-bank providers has risen sharply in recent years. In the Netherlands, non-banks currently account for around one quarter of the market. Outside Europe, for example in the USA, non-bank firms have provided (or subscribed) around half of all mortgage loans in recent years. This represents a significant rise compared with the pre-crisis years. This is due in part to the fact that banks have partially withdrawn from the market after their negative experience during the crisis and are concentrating mainly on high-quality mortgages. Moreover, non-bank providers apply laxer regulation.

141 The results are based on a regular semi-annual survey on loans secured by commercial property among eight banks covering around 70% of the market.

…and the risks associated with commercial property markets continue to be largely exported

Owing to the limited share of exposures secured by commercial property in the balance sheets of Czech banks, developments in this market do not pose an immediate threat to financial stability even if prices gradually rise and become overvalued (see section 2.1). A large proportion of commercial property is financed by foreign capital and any materialisation of risks would primarily affect the financial systems in investor countries. The risks to the domestic banking sector may also be partly mitigated by the relatively even distribution of loans between different types of commercial property. A potential threat to the domestic financial stability could arise in the future from the growing investments of Czech households and other domestic investors in real estate funds, whose performance is directly or indirectly linked with developments in the commercial property market. However, the importance of these investments remains marginal despite this growth.

The risk characteristics of new loans deteriorated slightly overall in 2018 H2

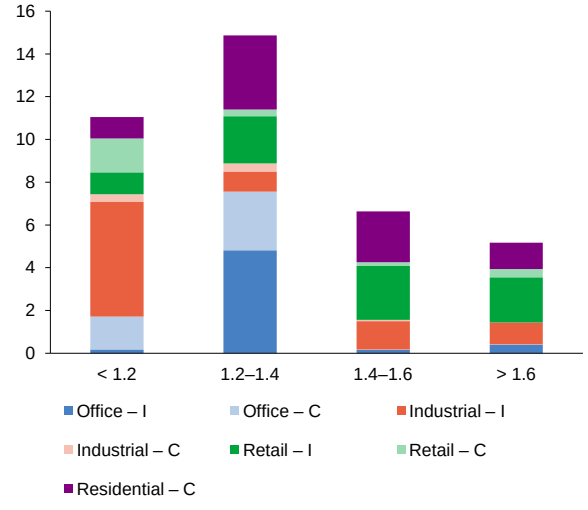
Most of the new loans provided in 2018 H2 had LTVs of 60%–70%, i.e. relatively safe levels (see Chart V.23). The share of loans in this category is gradually declining over time at the expense of riskier loans (see Chart V.10 CB). However, the absolute volume of riskier loans remains low. As regards DSCR, loans in the 1.2–1.4 range – considered by the industry to be the norm for most types of commercial property – remain the most frequently provided ones (see Chart V.24). However, the observed levels and the high proportion of loans with a DSCR of more than 1.4 do not necessarily imply an absence of credit risks. On the contrary, they may signal over-optimistic estimates of future property income in the current phase of the business and financial cycle. An increase in overall credit risk is suggested by an increase in loans with simultaneously riskier levels of collateral (an LTV of over 70%) and the ability to generate income to cover debt (a DSCR of below 1.2). These loans amounted to almost CZK 10 billion in 2018 H2, more than double the level in the previous half-year. However, given the low volumes of loans secured by commercial property, the results may reflect ad hoc factors and the risk characteristics of only a very limited number of loans.

Overall, the risks associated with loan financing of residential and commercial property purchases and construction represent one of the main sources of potential systemic risk in the Czech Republic. As in several other EU countries, analyses conducted by the ESRB indicate a similar conclusion. The CNB will therefore continue to pay great attention to these risks in the period ahead and consider the application and configuration of instruments that will keep them at an acceptable level.

Chart V.24

DSCR distribution of new loans in 2018 H2

(x-axis: DSCR; y-axis: CZK billions)

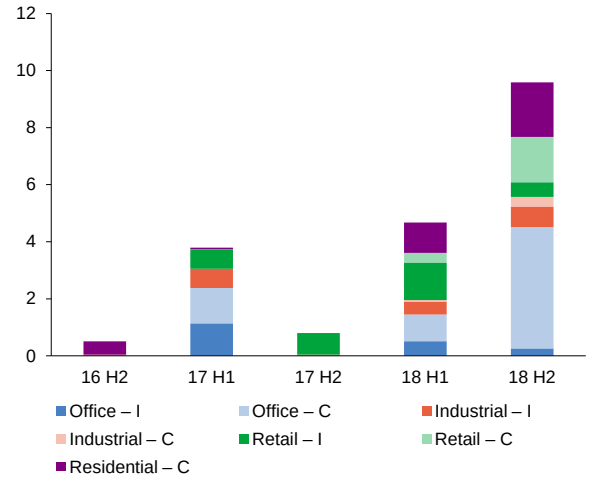


Source: CNB
Note: I: investment in existing property, C: construction.

Chart V.25

Amount of new loans with an LTV of more than 70% and a DSCR of less than 1.2

(CZK billions)



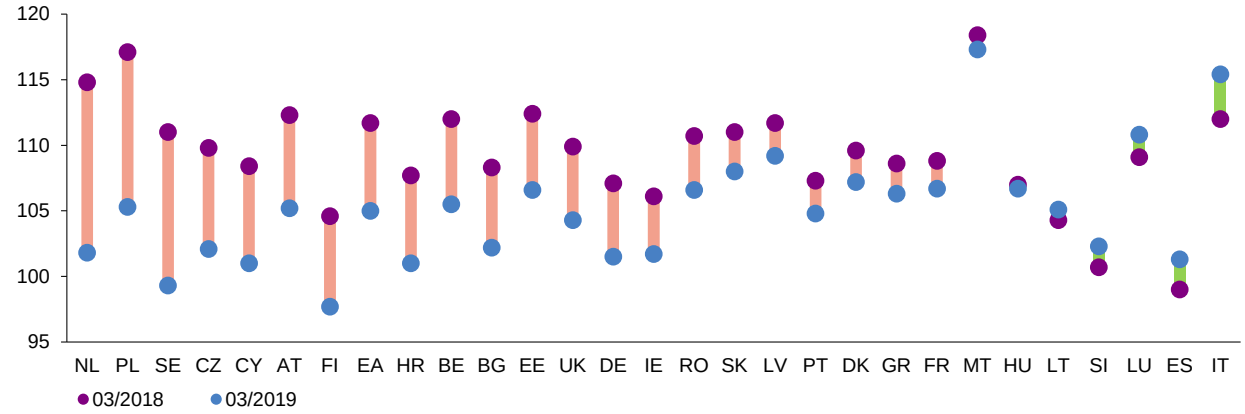
Source: CNB
Note: I: investment in existing property, C: construction.

CHAPTER 2

Chart II.1 CB

Overall indicator of economic confidence in selected EU countries

(base index)

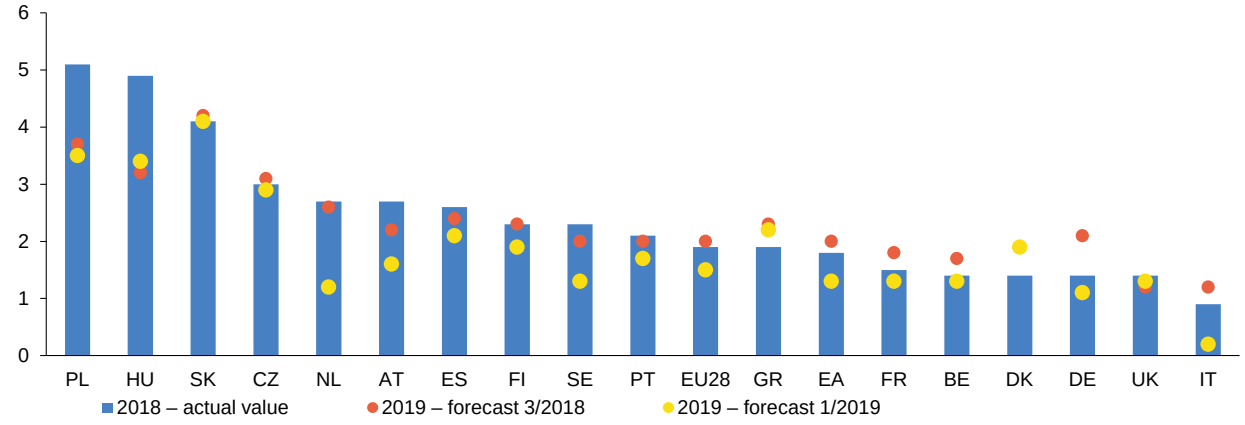


Source: Eurostat

Chart II.2 CB

Economic growth and forecasts thereof in selected EU countries

(annual real growth in %)

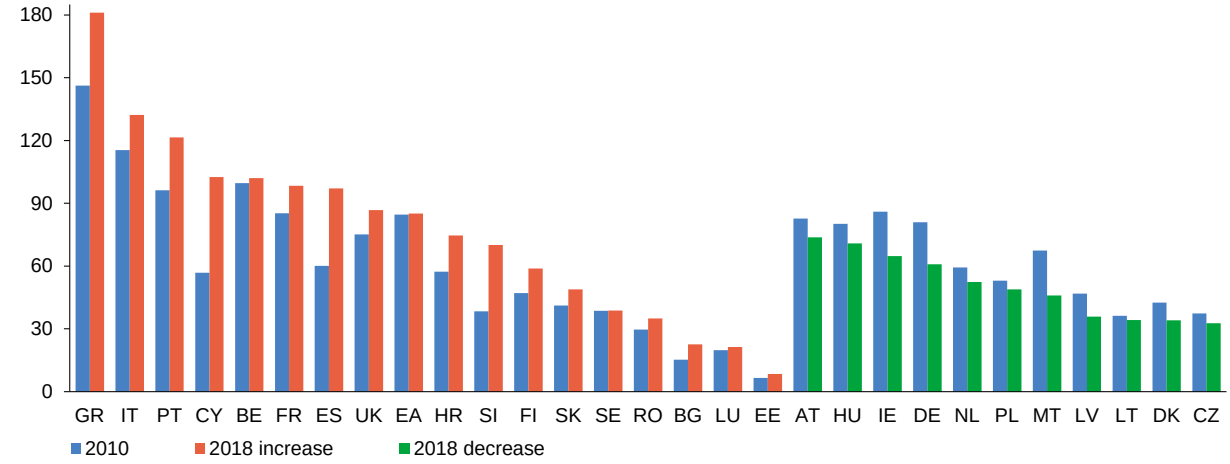


Source: European Commission

Chart II.3 CB

Change in government debt between 2010 and 2018 in selected EU countries

(% of GDP)

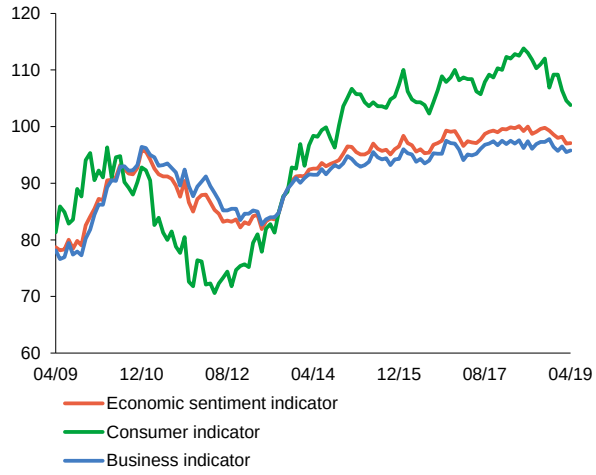


Source: Eurostat

Chart II.4 CB

Confidence indicators for consumers and non-financial corporations

(basic index to the average of 2005)

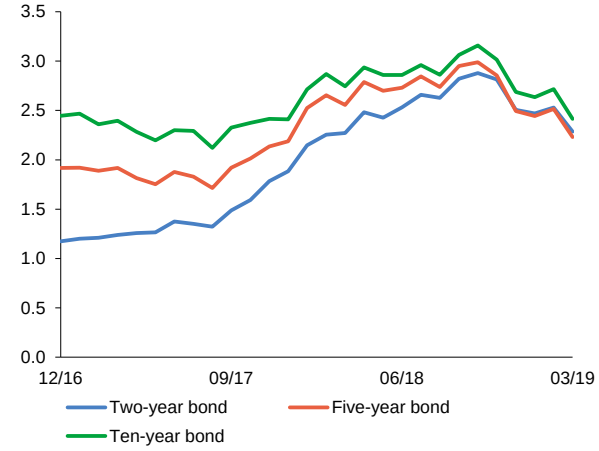


Source: CZSO

Chart II.5 CB

US government bond yields

(%)

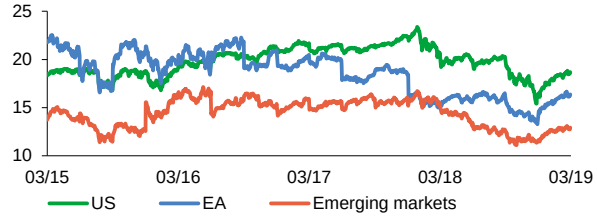


Source: Thomson Reuters

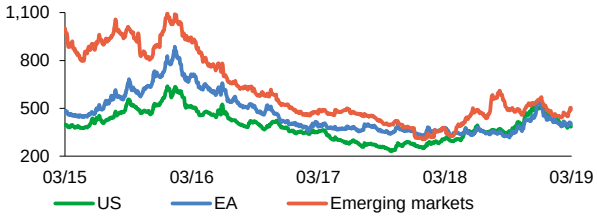
Chart II.6 CB

Indicators of stock and bond price adequacy and market volatility

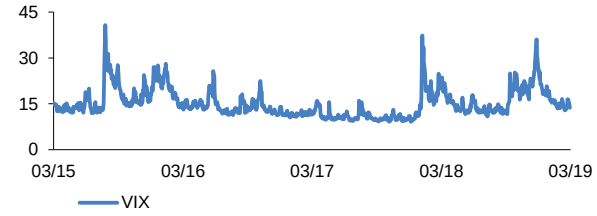
(market stock price in multiples of annual earnings)



(risk premia for risky corporate bonds in bp)



(indices in points)

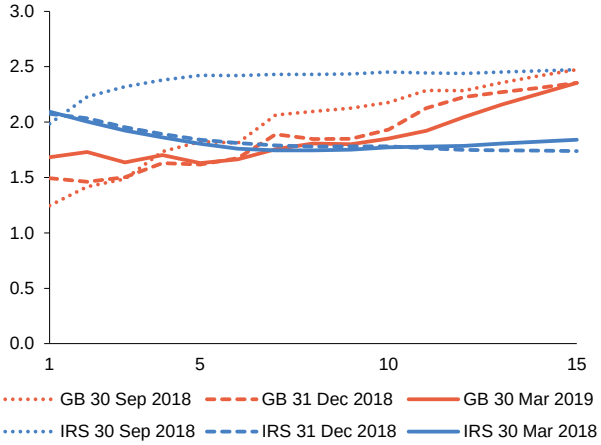


Source: Bloomberg, CNB
Note: Stocks – SP500 for US, Euro Stoxx 50 for EA and MSCI Emerging for emerging markets. Bonds – yield spread for speculative-grade bonds (BB+ or lower) vis-à-vis government bonds adjusted for any embedded options (option-adjusted spread).

Chart II.7 CB

Yield curve for Czech government bonds and koruna interest rate swaps

(%; x-axis: maturity in years)

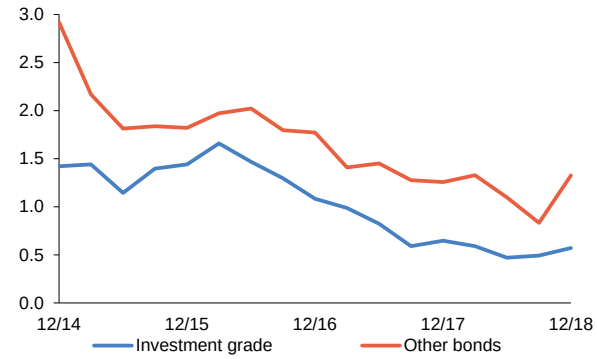


Source: CNB
Note: GB = government bond, IRS = interest rate swap.

Chart II.8 CB

Credit spreads on domestic corporate bonds

(%)

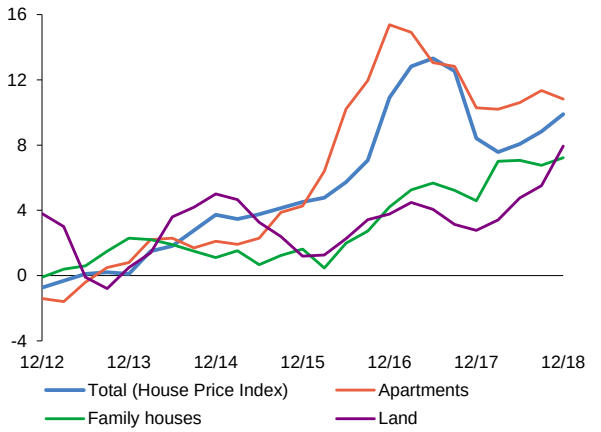


Source: CNB
Note: The interest rate spread is calculated as the difference between the yield on corporate bonds and the rate for an interest rate swap of corresponding currency and maturity. The calculation uses traded corporate bonds issued by domestic entities or denominated in koruna. The values represent averages weighted by the volume of these bonds held by domestic financial institutions. Other bonds comprise bonds rated BB or lower and unrated bonds.

Chart II.9 CB

Transaction prices by type of property

(year-on-year growth in %)

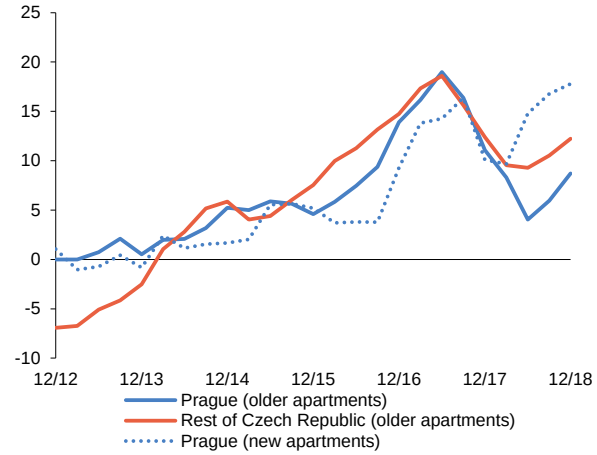


Source: CZSO, Hypoindex
Note: Prices of apartments, family houses and land in 2018 were obtained by extending the CZSO time series using Hypoindex data.

Chart II.10 CB

Apartment transaction prices by region

(year-on-year growth in %)

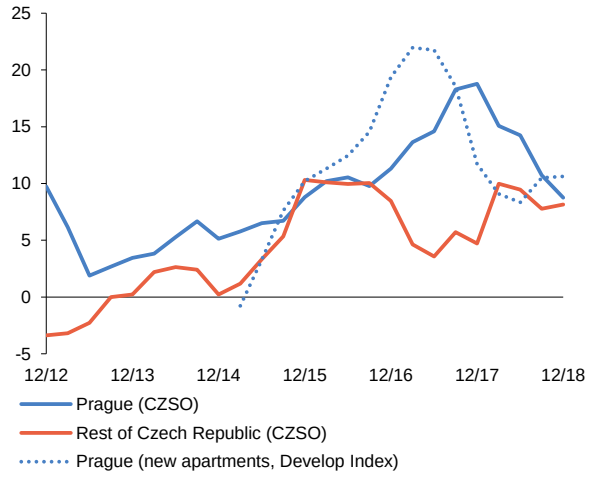


Source: CZSO

Chart II.11 CB

Apartment asking prices by region

(year-on-year growth in %)

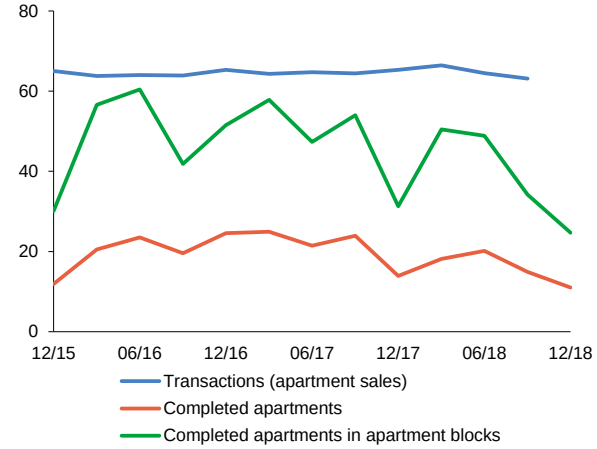


Source: CZSO, Společnost pro cenové mapy ČR, s.r.o.
Note: Transaction prices from a CZSO survey. As the Develop Index is published every two months, the figures for March and September were obtained as the average of the year-on-year growth rates in February and April and in August and October respectively.

Chart II.12 CB

Share of Prague in selected characteristics for the Czech Republic

(%)

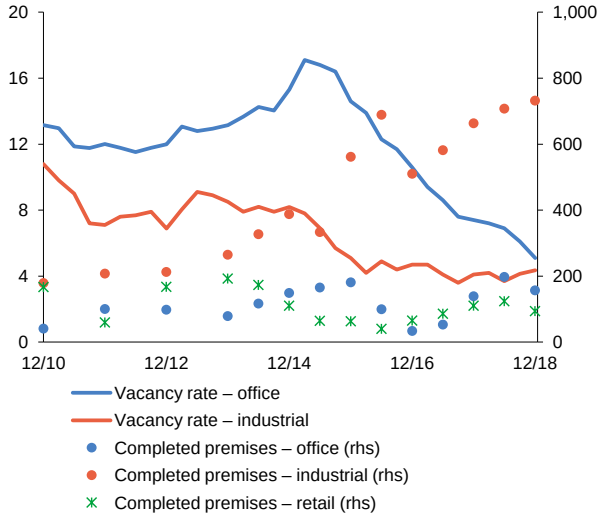


Source: CZSO, Společnost pro cenové mapy ČR, s.r.o.

Chart II.13 CB

Vacancy rates and completed premises for commercial property

(vacancy rates in %; right-hand scale: space in thousands of m^2)

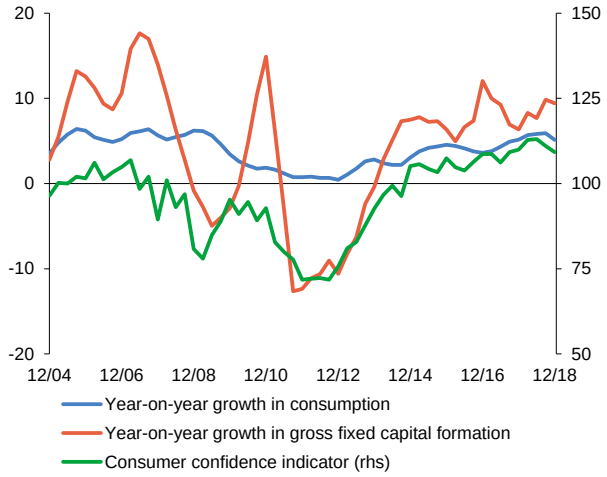


Source: Jones Lang LaSalle
Note: Stocks of completed premises are reported at annual frequency until 2013 and as annual moving totals at semi-annual frequency from 2014 onwards.

Chart II.14 CB

Household consumption, investment and confidence

(%; right-hand scale: base index relative to 2005 average)

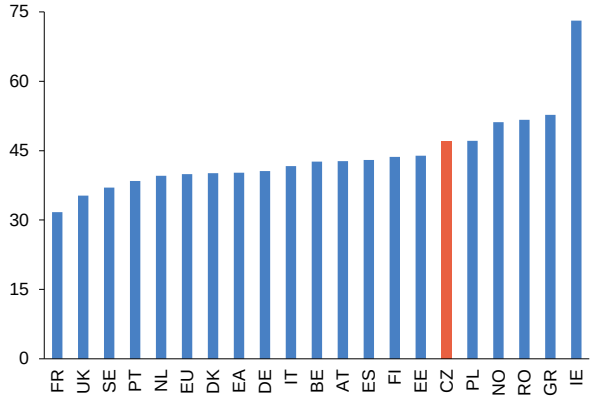


Source: CZSO
Note: Growth rates are smoothed by the three-period average.

Chart II.15 CB

Profit rate in the non-financial corporations sector by European comparison

(%)

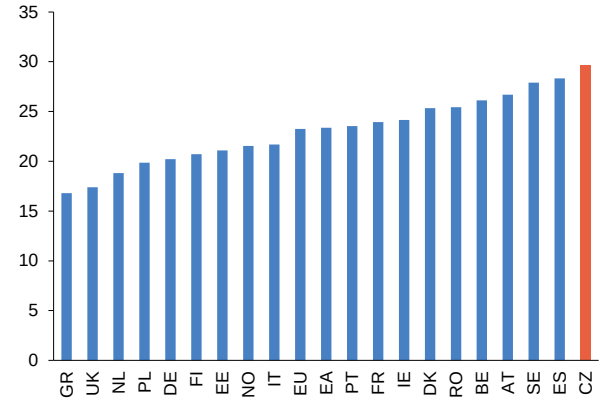


Source: Eurostat
Note: Data as of 31 December 2018. For Belgium, Greece, Norway, Romania, Ireland, Poland and the EU aggregate, data for 2018 Q3 are used due to data unavailability.

Chart II.16 CB

Investment rate in the non-financial corporations sector by European comparison

(%)

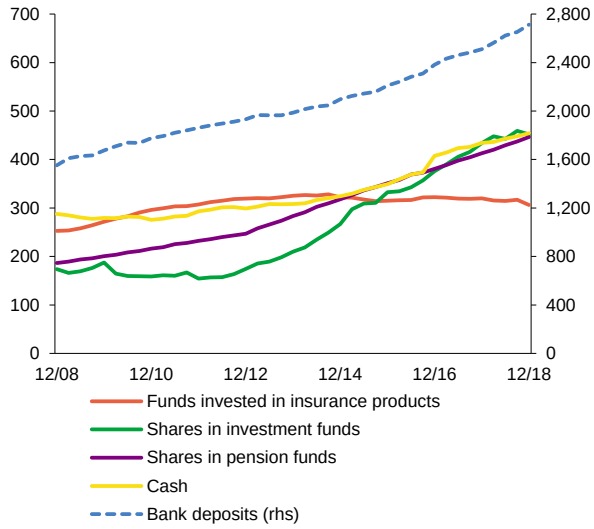


Source: Eurostat
Note: Data as of 31 December 2018. For Belgium, Greece, Norway, Romania, Ireland, Poland and the EU aggregate, data for 2018 Q3 are used due to data unavailability.

Chart II.17 CB

Financial assets of households

(CZK billions)

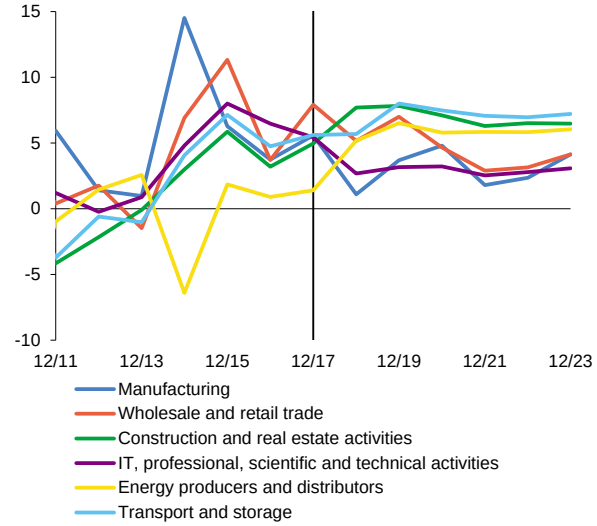


Source: CNB
Note: The figures comprise exposures to domestic and foreign entities. Directly held financial instruments (shares, other equity and bonds) are excluded.

Chart II.18 CB

Growth in gross value added in the largest sectors

(year-on-year growth in %)



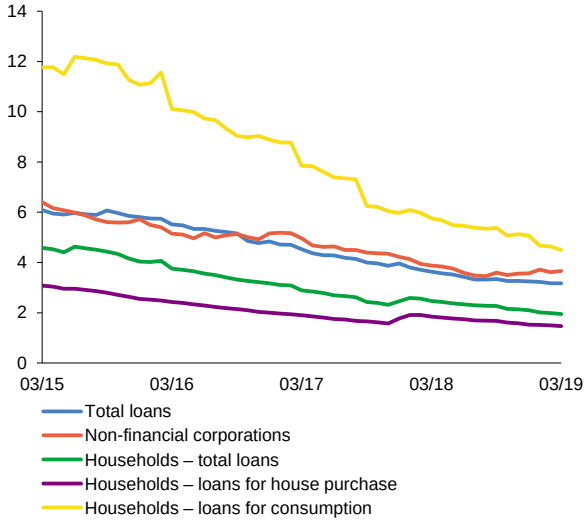
Source: CZSO, CNB

Note: The vertical line separates observations from predictions. The prediction for each sector is based on the macroeconomic forecast published in Inflation Report I/2019. The forecast threshold corresponds to 2017 in line with the latest known input-output table.

Chart II.19 CB

NPL ratio for bank loans to the private non-financial sector

(%)

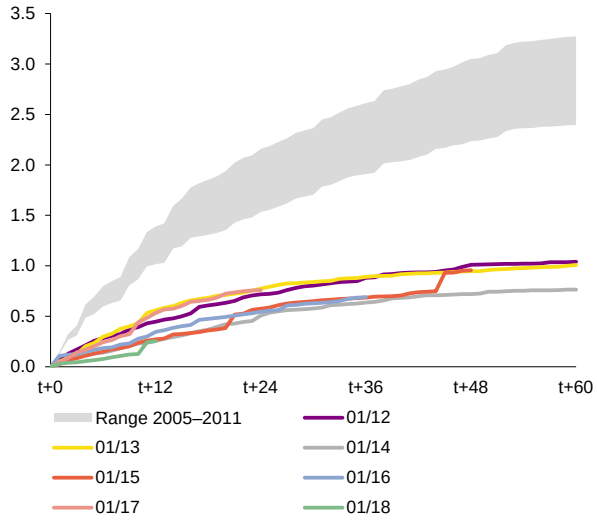


Source: CNB

Chart II.20 CB

Riskiness of loans to non-financial corporations by date of provision

(cumulative default rate in %)



Source: CNB

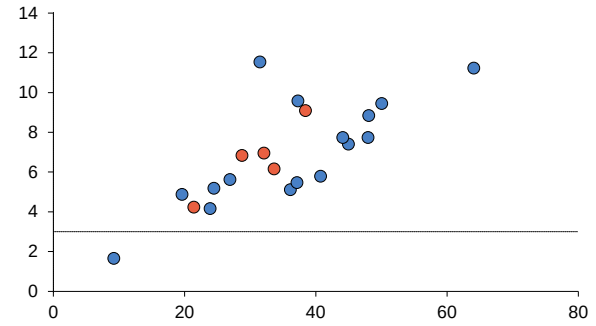
Note: The initial slope of the curve provides a relatively good signal about the subsequent evolution of the riskiness of loans provided in the given period.

CHAPTER 3

Chart III.1 CB

Leverage ratios and risk weights for domestic banks as of the end of 2018

(x-axis: risk weight in %, y-axis: leverage ratio in %)

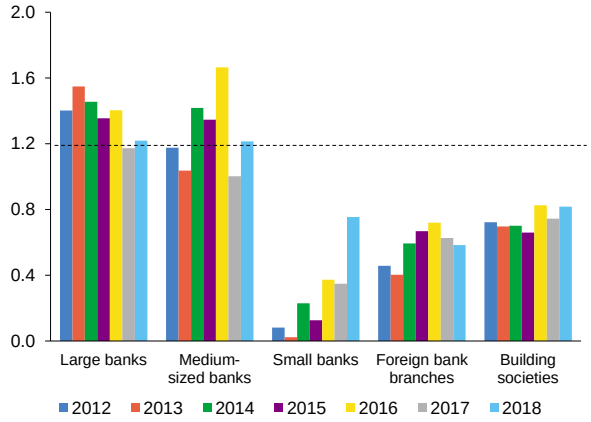


Source: CNB
Note: The black horizontal line depicts the minimum leverage ratio of 3%. Red dots indicate domestic systemically important banks with a non-zero systemic risk buffer. The x-axis denotes the so-called implicit risk weights. These are calculated as a weighted value of the exposure / value of exposure according to the European reporting framework COREP.

Chart III.2 CB

Return on assets (RoA)

(%)

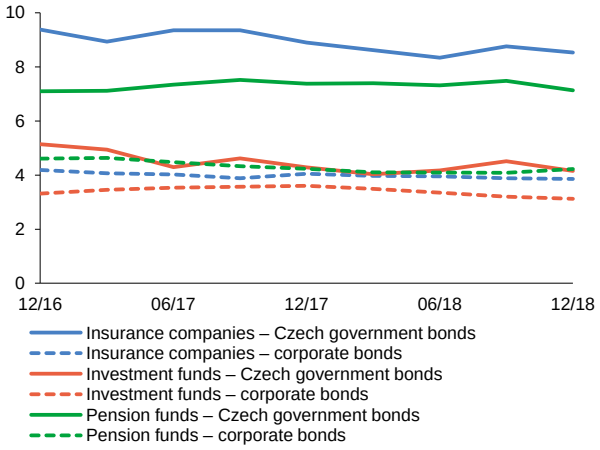


Source: CNB
Note: The classification of banks by asset size is according to the CNB methodology valid since 2018. The horizontal line depicts the RoA value for the banking sector as a whole for the end of 2018.

Chart III.3 CB

Average maturity of bonds in the balance sheets of domestic institutional investors

(years)

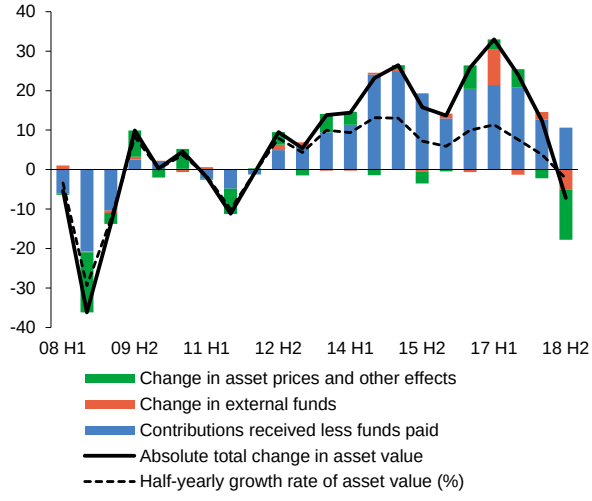


Source: CNB
Note: Average maturity is calculated as the average weighted by the volume of bond holdings.

Chart III.4 CB

Decomposition of change in assets of collective investment funds

(CZK billions; growth rate of asset value in %)

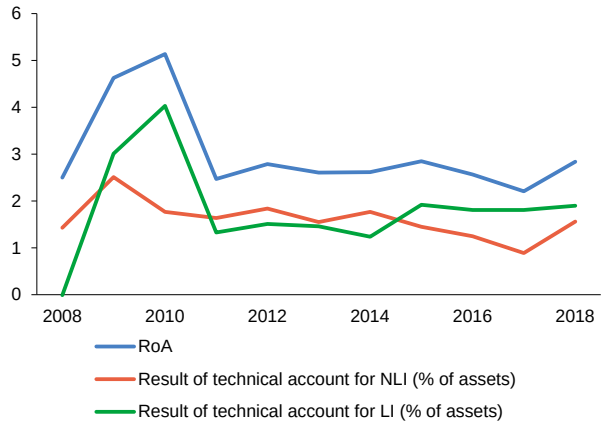


Source: CNB
Note: Chart depicts half-yearly changes.

Chart III.5 CB

Insurance sector profitability

(%)

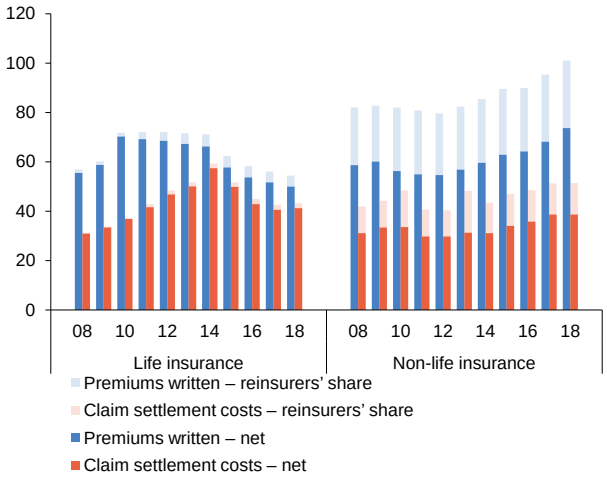


Source: CNB
Note: LI = life insurance, NLI = non-life insurance. The Export Guarantee and Insurance Corporation is excluded from the calculation.

Chart III.6 CB

Developments in the insurance sector

(CZK billions)



Source: CNB
Note: The Export Guarantee and Insurance Corporation is excluded from the calculation.

Table III.1 CB

Structure of exposures according to level of risk and coverage by provisions after the introduction of IFRS 9

(change between 31 Jan 2018 and 31 Dec 2018 in %)

			Households		Non-financial corporations		Aggregate	
Coverage ratio								
Total			1.6%	-15.3%	2.8%	-8.7%	2.2%	-11.8%
Of which:	No increase in risk (Stage 1)	Performing	0.2%	-2.9%	0.3%	-12.5%	0.2%	-8.1%
	Increase in risk (Stage 2)		4.2%	-22.4%	3.2%	-11.2%	4.2%	-16.0%
	Impairment (Stage 3)	Non-performing	58.8%	0.9%	57.3%	7.0%	57.5%	4.3%
Exposures								
Total			1,734	7.1%	1,330	6.7%	3,063	6.9%
Of which:	No increase in risk (Stage 1)	Performing	1,589	5.9%	1,178	7.2%	2,767	6.5%
	Increase in risk (Stage 2)		109	43.1%	99	10.5%	208	25.5%
	Impairment (Stage 3)	Non-performing	36	-14.9%	52	-8.7%	88	-11.3%
Provisions								
Total			29	-9.3%	37	-2.6%	65	-5.7%
Of which:	No increase in risk (Stage 1)	Performing	3	2.9%	3	-6.2%	6	-2.2%
	Increase in risk (Stage 2)		5	11.0%	3	-1.8%	8	5.4%
	Impairment (Stage 3)	Non-performing	21	-14.1%	30	-2.3%	51	-7.5%

Source: CNB
Note: The figures in the first, third and fifth columns indicate stocks as of 31 December 2018. The "Aggregate" values aggregate the information for both sectors.

CHAPTER 4

Table IV.1 CB

Parameters of selected items in the idiosyncratic liquidity test

(%)

	up to 1 month	2 to 3 months	3 to 6 months
Outflow parameter for secured transactions and credit on capital market	100	100	100
Outflow parameter for retail deposits	5	3	1,5
Outflow parameter for deposits other than stable retail deposits	according to counterparty 15–100	according to counterparty 10–100	according to counterparty 10–100
Outflow parameter for derivatives transactions	100	100	100
Inflow parameter for secured transactions and credit on capital market	100	100	100
Inflow parameter for repaid loans	according to counterparty 0–100	according to counterparty 20–100	according to counterparty 50–100
Inflow parameter for derivatives transactions	100	100	100

Source: CNB
Note: The range for deposits other than retail deposits is based on the deposit categorisation by stability (according to the type of counterparty and purpose of the deposit account).

Table IV.2 CB

Haircuts for counterbalancing capacity in the idiosyncratic liquidity test

(%)

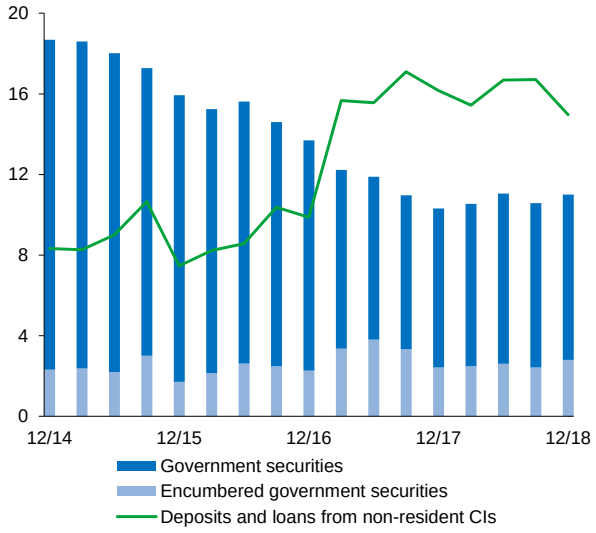
Asset type	Haircut
Coins, banknotes and reserves with central bank	0
Marketable assets level 1	0–7 according to security type and issuer
Marketable assets level 2A	10–15 according to issuer
Marketable assets level 2B	30–40 according to issuer
Other marketable assets	10–100 according to security type and issuer

Source: CNB
Note: Assets classified pursuant to Commission Delegated Regulation (EU) 2015/61. Range set mainly with regard to issuer's credit quality.

Chart IV.1 CB

Share of government securities and loans from non-resident banks

(% of balance sheet of domestic banks)

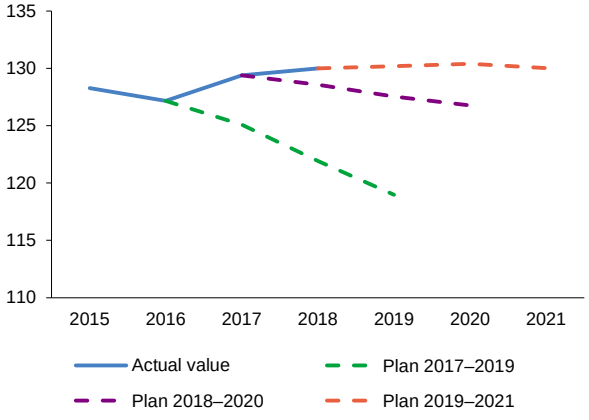


Source: CNB
Note: CIs = credit institutions.

Chart IV.2 CB

Planned and actual coverage of loans by primary funds

(%)



Source: CNB

CHAPTER 5

Table V.1 CB

Conversion of FCI values into the countercyclical capital buffer rate

Range of FCI values		CCyB rate
from	to	
0	0.09	0.00 %
0.09	0.11	0.25 %
0.11	0.13	0.50 %
0.13	0.15	0.75 %
0.15	0.17	1.00 %
0.17	0.20	1.25 %
0.20	0.23	1.50 %
0.23	0.27	1.75 %
0.27	0.30	2.00 %
0.30	0.34	2.25 %
0.34	1.00	2.50 %

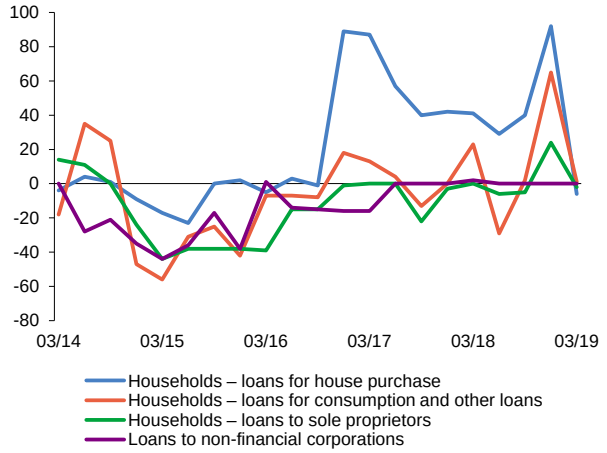
Source: CNB

Note: The financial expansion in the domestic economy just before the onset of the global financial crisis was so strong that if the tool had been available, a CCyB rate of at least the "threshold" level of 2.5% would have been required. For this reason, the historical maximum of the FCI is linked with a CCyB rate of 2.5%. Input data are normalised in the FCI calculation. The historical FCI values may therefore change as new data arrive, so the conversion table must be recalibrated regularly. The box displays the range that included the FCI value at the end of 2018.

Chart V.1 CB

Credit standards in the Czech Republic

(net percentages)



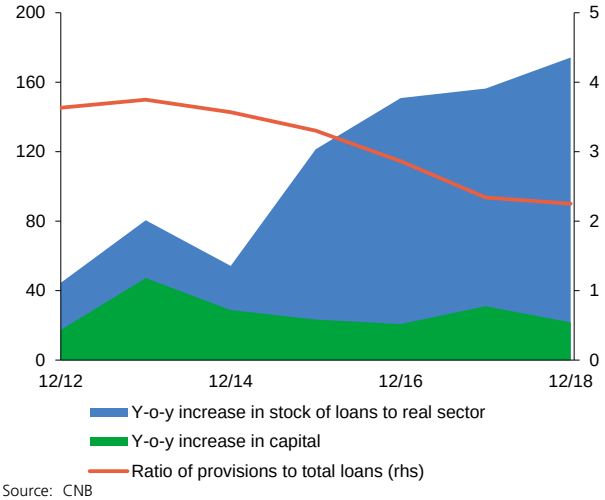
Source: Bank Lending Survey, CNB

Note: The data represent the difference between the market share of banks that reported a tightening of lending standards and banks that reported an easing of lending standards in the past three months. More information on the indicator methodology can be found on the CNB website.

Chart V.2 CB

Selected bank balance sheet indicators

(CZK billions; right-hand scale: %)

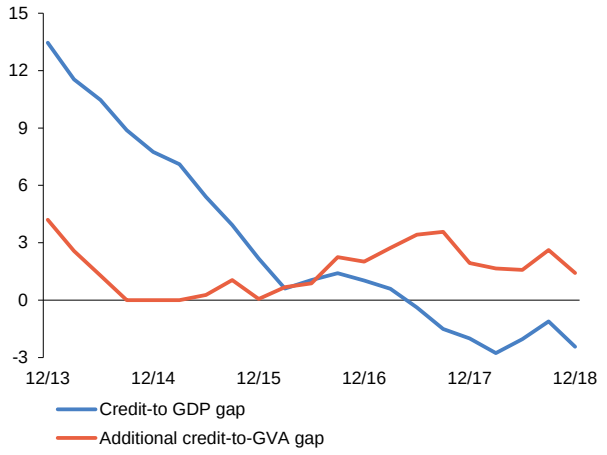


Source: CNB

Chart V.3 CB

Standardised credit-to-GDP gap and additional gap

(pp)



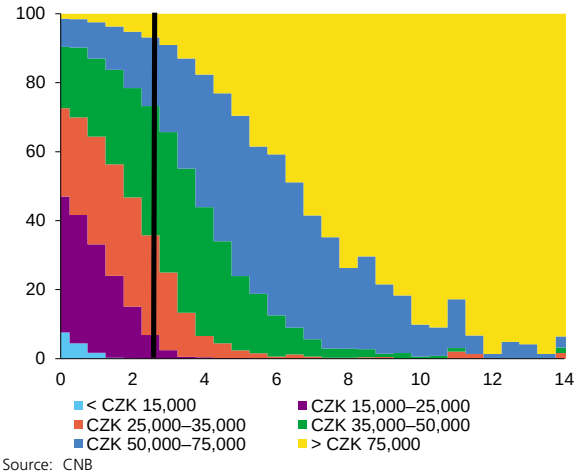
Source: CNB

Note: The trend in the standardised gap is estimated using the HP filter (lambda = 400,000) over the entire time series. The additional gap – the expansionary credit gap – is calculated as the difference between the ratio of bank loans to the gross value added (GVA) of the non-financial private sector and the moving minimum level of this ratio over the past eight quarters.

Chart V.4 CB

Total debt distribution by declared income

(x-axis: CZK millions; y-axis: % of given category)

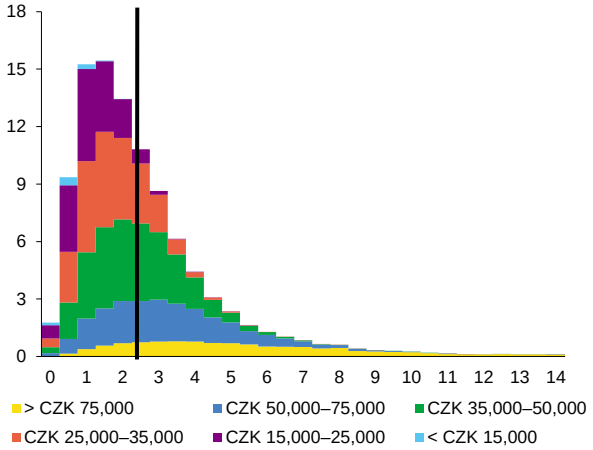


Source: CNB
Note: The vertical line denotes the median debt.

Chart V.5 CB

Total debt distribution by declared income

(x-axis: CZK millions; y-axis: % of total debt)

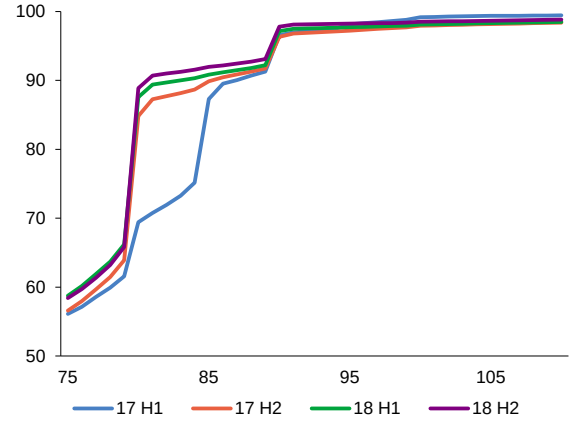


Source: CNB
Note: The vertical line denotes the median debt.

Chart V.6 CB

Empirical cumulative distribution function of LTVs

(x-axis: LTV in %; y-axis: cumulative percentage of loans)

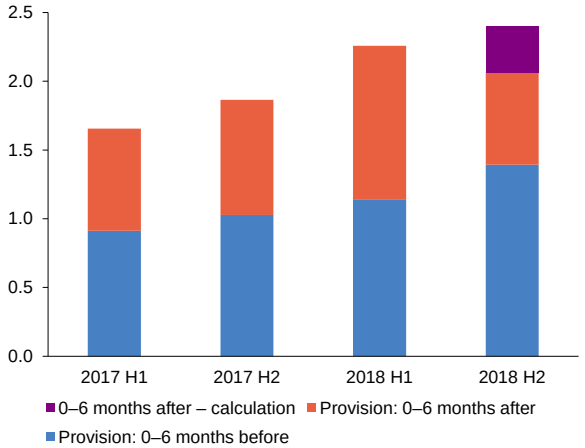


Source: CNB
Note: The curves plot the percentage share of loans with the given or lower LTVs.

Chart V.7 CB

Concurrent provision of unsecured and mortgage loans

(x-axis: half-year in which the mortgage loan was provided; y-axis: unsecured loans in CZK billions)

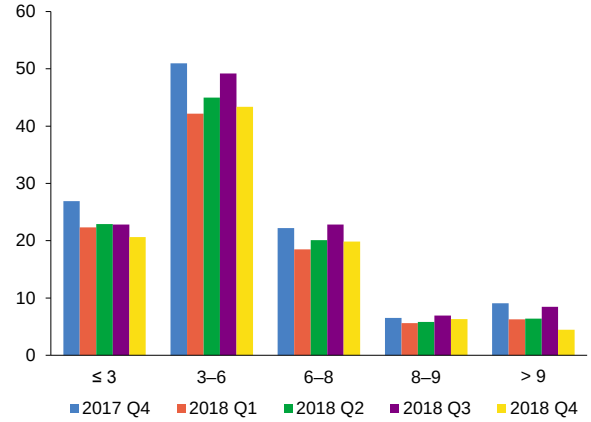


Source: CNB
Note: The designations "before" and "after" relate to the time of provision of the mortgage loan. For the first and last period, the data are calculated to add up to the total, as known data do not cover the whole six months. Data for periods of one year before the provision of the mortgage loan and one year after it provide a similar picture.

Chart V.8 CB

LTI distribution of new loans

(x-axis: LTI in years; y-axis: share of loans in volume in %)

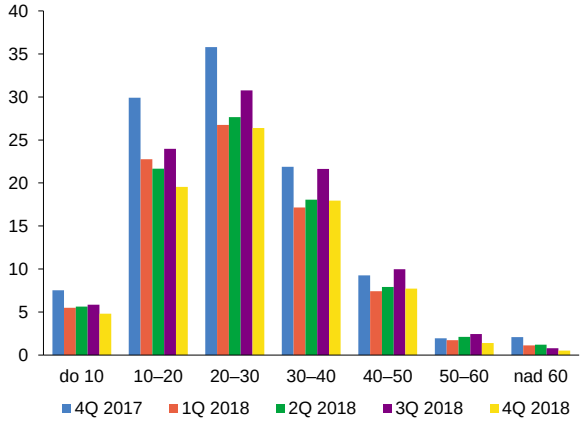


Source: CNB
Note: Relative to the volume of loans a quarter earlier. Interval closed from the right.

Chart V.9 CB

LSTI distribution of new loans

(x-axis: LSTI in %; y-axis: share of loans in volume in %)

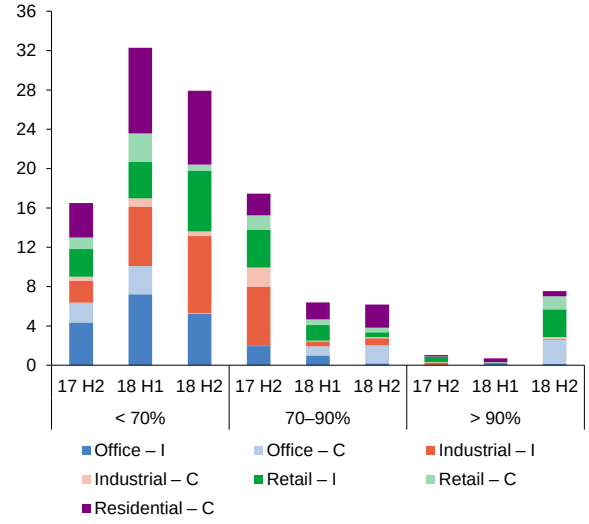


Source: CNB
Note: Relative to the volume of loans a quarter earlier. Interval closed from the right.

Chart V.10 CB

LTV distribution of new loans over time

(x-axis: LTV in %; y-axis: CZK billions)



Source: CNB
Note: I: investment in commercial property, C: construction.

GLOSSARY

Bank Lending Survey (BLS) A survey of bank lending conditions for non-financial corporations and households in the Czech Republic, the pilot round of which took place in 2012 Q1. The survey aims to obtain qualitative information on current perceptions of the situation on both the supply and demand side of the credit market.

Basel III A new regulatory framework issued by the Basel Committee on Banking Supervision in 2010 which sets standards for capital adequacy of banks and now also for their liquidity. Overall, Basel III introduces stricter rules than the previous framework and came into existence mainly as a reaction to the financial crisis.

Breakdown of banks by total assets
In some charts and tables in the FSR, banks are assigned to groups based on the amount of their total assets. The breakdown of banks into groups is revised at the end of each calendar year. In 2007 and 2008, banks having total assets of over CZK 150 billion were regarded as large banks, banks having total assets of over CZK 50 billion and up to CZK 150 billion were regarded as medium-sized banks and banks having total assets of less than CZK 50 billion were regarded as small banks. In 2009 the total amount of assets necessary for inclusion in the group of large banks was increased to CZK 200 billion and the range for medium-sized banks was changed to CZK 50 billion–CZK 200 billion. The range for small banks was unchanged. As from 2012, the breakdown of banks by total assets is as follows: large banks have total assets of over CZK 250 billion, medium-sized banks have total assets of over CZK 50 billion and up to CZK 250 billion and small banks have total assets of less than CZK 50 billion.

Capital ratio The ratio of regulatory capital to total risk-weighted assets. The Tier 1 capital ratio is the ratio of Tier 1 capital to total risk-weighted assets (see also Tier 1).

Capital requirement The capital requirement is the amount of capital a bank has to hold so as to cover all the risks it undertakes.

Collective investment funds (CIFs)
Mutual and investment funds whose sole business activity is collective investment, i.e. collecting funds from investors and investing them. CIFs are broken down by investor type into funds intended for the public (dominated by open-ended mutual funds) and funds for qualified investors, and by asset risk into money market, bond, equity, mixed and real estate funds and funds of funds. Sometimes the category of funds of funds is not listed separately, but is included in the other categories according to the type of funds in which they invest.

Common Reporting Framework (COREP)
A common reporting framework in the EU, prepared by the European Banking Authority (EBA) for data reporting in accordance with prudential requirements (under CRR). It covers the areas of capital, capital adequacy, risk exposures, operational risk, market risk and credit risk.

Consumer credit Credit used to finance household consumption. It also includes bank overdrafts and debit balances and credit card credit.

Countercyclical capital buffer
A macroprudential tool designed to increase the banking sector's resilience to cyclical risks associated with fluctuations in lending.

Debt service-to-income (DSTI)
The ratio of total debt service to the net income of the loan applicant.

Debt-to-income The ratio of debt to the net income of the loan applicant.

Default Default is defined as a breach of the debtor's payment discipline. The debtor is in default at the moment when it is probable that he will not be able to repay his obligations in a proper and timely manner, without recourse by the creditor to settlement of the claim from the security, or when at least one repayment (the amount of which deemed by the creditor to be significant) is more than 90 days past due.

Deleveraging A process consisting in the reduction of leverage, i.e. the reduction of indebtedness, which decreases the profitability of economic agents, but also the degree of risk associated with them.

Household insolvency A situation where a household is unable to cover its current expenditures by its current income and the sale of its asset holdings. Insolvency is defined in legal terms in Act No. 182/2006 Coll., on Insolvency and Methods of Resolution Thereof.

IFRS 9 The financial reporting standard IFRS 9 *Financial instruments*, the final version of which was introduced in July 2014 by the International Accounting Standards Board (IASB), took effect on 1 January 2018 pursuant to Commission Regulation (EU) 2016/2067, replacing the previously valid IAS 39 standard. IFRS 9 lays down requirements for the recognition, valuation, impairment and derecognition of financial assets and financial liabilities and general hedge accounting. It aims to provide financial statement users with relevant information for assessing the size, timing and uncertainty of an entity's future cash flows.

Institutional investor Either (a) a bank executing trades in investment instruments on its own account on the capital market, a management company, an investment fund, a pension fund or an insurance company, or (b) a foreign entity authorised to carry on business in the same fields in the Czech Republic as the entities listed under (a).

Interest margin The difference between a bank's loan rate and its deposit rate.

Interest rate spread Also interest rate differential; the spread between the interest rate on a contract (deposit, security) and a reference interest rate.

Leverage See Leverage ratio.

Leverage ratio The CRD IV/CRR rules define the leverage ratio as capital to risk-weighted assets. The term leverage is also often used in financial economics. There, however, capital is the denominator in the ratio (e.g. assets/capital or debt/capital). When we say that a bank has high leverage, we generally refer to the definition consistent with the assets/capital ratio. However, such a bank has a low leverage ratio.

Liquidity coverage ratio A requirement to cover net liquidity outflows over a 30-day time horizon with liquid assets. It is calculated as the ratio of the liquidity buffer to the net liquidity outflow.

Loan for house purchase A loan intended for the acquisition of residential property.

Loan service-to-income The ratio of loan-related debt service to the net income of the loan applicant.

Loan-to-income (LTI) The ratio of the amount of a loan to the net income of the loan applicant.

Loan-to-value (LTV) The ratio of the amount of a loan to the value of collateral.

Loss given default (LGD) The ratio of the loss on an exposure in the event of counterparty default to the amount owed at the time of default.

Macroprudential policy A key component of financial stability policy. It focuses on the stability of the financial system as a whole. Its main objective is to help prevent systemic risk.

Market liquidity The ability of market participants to carry out financial transactions in assets of a given volume without causing a pronounced change in their prices.

Minimum Requirement for Own Funds and Eligible Liabilities (MREL)
A sufficient volume of eligible liabilities is necessary for a failed bank to be recapitalised using internal funds (bail-in). In the event of a crisis, the CNB writes off or converts these liabilities. A sufficient MREL together with the application of a suitable combination of resolution tools thus enables a failed institution to be resolved without the use of public money.

Mortgage refinancing The process whereby a mortgage debtor accepts a new loan from a different lender than the one from which he received the original loan and uses it to repay the original loan. He thus becomes a debtor of the other lender, but usually under more favourable conditions. This is usually possible only at the end of the original loan's fixation period.

Mortgage refixation The process whereby at the end of the fixation period of a mortgage loan the debtor selects the length of the new fixation period and negotiates new conditions for this period with the creditor. In this case, the identity of the creditor does not change.

Net financial assets The difference between the sum of financial assets and the sum of liabilities.

Net stable funding ration (NSFR)
A structural liquidity requirement monitored over a one-year time horizon. It is defined as the ratio of available stable funding to required stable funding.

Non-performing loans A loan is non-performing if at least one of the following two situations occurs: a) the debtor is unlikely to pay its credit obligations in full without recourse to actions such as realising security, b) the debtor is past due more than 90 days on a credit obligation. For details, see Article 178 of Regulation (EU) No 575/2013 of the European Parliament and of the Council.

Overnight indexed swap A term contract between economic agents consisting in the mutual exchange of interest payments corresponding to a fixed rate and a floating overnight financial market reference rate.

Pension funds In the Czech environment, pension funds are transformed and participation funds which are managed by pension management companies. Participation funds are further classed into obligatory conservative funds and other funds. Obligatory conservative funds are only allowed to invest in a significantly restricted group of assets.

Pillar 1 The first part of the CRD directive, focused on the determination of minimum capital requirements for all credit institutions to cover credit, market and operational risks.

Pillar 2 The second part of the CRD directive, requiring credit institutions to assess whether the Pillar 1 capital requirement is sufficient to cover all the risks to which they are exposed. This assessment process is reviewed by the supervisory authority under the supervisory review and evaluation process (SREP). The supervisory authority then can apply a wide range of instruments, including setting an additional capital requirement, for example to cover concentration risk.

Prague InterBank Offered Rate (PRIBOR)
The reference interest rate on the interbank deposit market for deposit sales. Reference banks quoting the PRIBOR must be important participants in the interbank market.

Price-to-income (PTI) A housing affordability indicator calculated as the ratio of the property price to the annual income of the household or loan applicant.

Price-to-rent (PR) The ratio of the price of an apartment to the annual rent. The price-to-rent ratio is the inverse of the rental return.

Property asking prices Property sale asking prices in estate agencies. Asking prices should be higher than transaction prices. Property asking prices in the Czech Republic are published, for example, by the CZSO and the Institute for Regional Information (which also publishes data on market rent supply prices).

Property developers/developments
Companies/projects whose aim is to build a complex of residential and commercial property. Property developers' work includes choosing an appropriate site, setting up a project, obtaining the necessary permits, building the necessary infrastructure, constructing the buildings and selling the property. Developers also often organise purchase financing for clients and frequently lease or manage the property once it is built (especially in the case of commercial property). Given the combination of construction activity and speculative property purchases, developers' results are strongly dependent on movements in property prices.

Property price gap The deviation of the price of property from its estimated equilibrium value.

Property transaction prices
Prices of actual transactions on the property market, which should be the closest to actual market prices. The CZSO has been publishing two types of data on property transaction prices since 2011. Prices based on Ministry of Finance statistics from property transfer tax returns and published by the CZSO are the older source. These data contain time series from 1998 and are available in a relatively detailed breakdown (by region, degree of wear and tear and type of property). On the other hand, they do not include transactions which are not subject to property transfer tax (i.e. primarily transactions in new property) and the index is published with a lag of at least half a year. The second, new source of data on property transaction prices is data from CZSO surveys in estate agencies. They cover new property, but are not available in such a long time series and such a detailed breakdown.

Quantitative easing A method for implementing monetary policy in a situation where the central bank is no longer able to lower its monetary policy rate because it has already reduced it almost to zero. Quantitative easing involves the central bank buying assets from commercial banks and

thereby creating a sizeable stock of free reserves with those banks. The purpose of this type of policy is to strengthen the balance-sheet and market liquidity of the banking system and minimise the risk of growth in interest rates due to insufficient liquidity. In the past ten years, quantitative easing has been applied in Japan and the USA. A similar policy is now being pursued, for example, by the ECB.

Rental return The ratio of the annual supply rent to the asking price of the apartment. It is the inverse of the price-to-rent ratio.

Return on assets (RoA) The ratio of pre-tax profit and interest to total assets of a firm.

Return on equity (RoE) The ratio of net profit to equity of a firm.

Risk premium The risk premium an investor demands on investments in riskier financial instruments.

Saving rate (households) A flow indicator showing the ratio of savings to gross disposable income of households. In simplified terms, savings are the part of income not spent on consumption in a given period.

Search for yield A situation where economic agents attempt to make up for generally low asset yields by seeking riskier-than-usual investments that yield a premium in return for the increased risk. Such behaviour may increase the future risks to the financial system.

Solvency (insurance companies)
Solvency in the insurance sector is the ability of an insurer to meet its insurance obligations, i.e. to settle eligible insurance claims arising from insured losses.

Solvency II A European regulatory framework (directive) for European insurance companies and reinsurers laying down quantitative and qualitative requirements and prudential rules, including requirements to comply with market discipline and disclosure duties. It entered into force in 2016, when it replaced the Solvency I regulatory framework.

Sovereign risk The risk that a government will default on its obligations, leading to national bankruptcy or restructuring of government debt.

Systemic risk The risk of the entire financial system or market collapsing.

Tier 1 The highest quality and, for banks in the Czech Republic, also the most significant part of regulatory capital. The dominant components of Tier 1 are equity capital, retained earnings and mandatory reserve funds.

VIX An index of expected 30-day volatility of US stocks (S&P 500 index), derived from market prices of options traded at the Chicago Board Options Exchange. A higher value indicates higher expected volatility of the stock index, and therefore higher market uncertainty.

Yield spread Also yield differential; the spread between the yield on a bond and the yield on a reference ("benchmark") bond.

ABBREVIATIONS

BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
bp	basis point
BRCI	Bank Register of Client Information operated by Czech Credit Banking Bureau
C	construction
CB	central bank
CBCB	Czech Banking Credit Bureau
CCoB	capital conservation buffer
CCyB	countercyclical capital buffer
CDS	credit default swap
CEB	Czech Export Bank
CET1	common equity Tier 1
CI	credit institution
CNB	Czech National Bank
CNCB	Czech Non-Banking Credit Bureau
COREP	The Common Reporting Framework
Coll.	collection
CPI	Consumer Price Index
CRD	Capital Requirements Directive
CRR	Capital Requirements Regulation
CZK	Czech koruna
CZSO	Czech Statistical Office
DSCR	debt service coverage ratio
DSTI	debt service-to-income
DTI	debt-to-income
EA	euro area
EBA	European Banking Authority
EC	European Commission
ECB	European Central Bank
EGAP	Export Guarantee and Insurance Company
EIB	European Investment Bank
EIOPA	European Insurance and Occupational Pensions Authority
EME	emerging market economies
ESFS	European System of Financial Supervision
ESMA	European Securities and Markets Authority
ESRB	European Systemic Risk Board
EU	European Union
EUR	euro
EURIBOR	Euro InterBank Offered Rate (reference interest rate on the interbank market)
FCI	financial cycle indicator
Fed	Federal Reserve systém
FI	financial institution
FINREP	Financial Reporting
FSR	Financial Stability Report
G20	Group of TwentyGB government bond
GDI	gross disposable income
GDP	gross domestic product
GFSR	Global Financial Stability Report

GNI	gross national income
G-SII	Global systemically important institution
H	half-year
HBS	Household Budget Statistics
I	investment
IAS	International Accounting Standards
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
IPFCs	investment and pension funds and companies
IR	Inflation Report
IRB	Internal Rating Based Approach, an approach within the Basel II framework for capital adequacy of banks
IRI	Institute for Regional Information
IRS	interest rate swap
ISR	sovereign risk indicator
IT	information technology
LCR	liquidity coverage ratio
LGD	loss given default
LLP	loan loss provision
LSTI	loan service-to-income
LTI	loan-to-income
LTV	loan-to-value
M	month
MBs	mortgage bonds
MF CR	Ministry of Finance of the Czech Republic
MM	money market
MREL	minimum requirement for own funds and eligible liabilities
MSCI	Morgan Stanley Capital International
NACE	General Industrial Classification of Economic Activities
NBER	The National Bureau of Economic ResearchNFC non-financial corporation
NFCEL	non-bank financial corporations engaged in lending
NP	natural person
NPISH	non-profit institutions serving households
NPL	non-performing loan
NRCI	Non-bank Register of Client Information
NSFR	net stable funding ratio
OECD	Organisation for Economic Cooperation and Development
OFIs	other financial intermediaries
O-SII	Other systemically important institutions
PD	probability of default
pp	percentage point
PRIBOR	Prague InterBank Offered Rate (reference interest rate on the interbank market)
PTI	price-to-income
Q	quarter
RoA	return on assets
RoE	return on equity
RPN	Research and Policy Notes
S&P	Standard & Poor´s
SCR	Solvency Capital Requirement
SMEs	small and medium-sized enterprises
SOLUS	Sdružení na ochranu leasingu a úvěrů spotřebitelům (Association for the Protection of Leasing and Loans to Consumers)
SRB	systemic risk buffer

STA	standardised approach to credit risk
TF	transformed fund
TLTRO	Targeted Longer-Term Refinancing Operations
TTC	through the cycle
TP	technical provision
ULI	Unit Linked Insurance
USA	United States
VIX	Volatility index
WGI	Worldwide Governance Indicators
WP	Working Paper
Y	year

COUNTRY ABBREVIATIONS

AT	Austria	IS	Iceland
AU	Australia	IT	Italy
BE	Belgium	JP	Japan
BG	Bulgaria	KR	South Korea
BR	Brazil	LT	Lithuania
CA	Canada	LU	Luxembourg
CL	Chile	LV	Latvia
CN	China	MT	Malta
CY	Cyprus	MX	Mexico
CZ	Czech Republic	MY	Malaysia
DE	Germany	NL	Netherlands
DK	Denmark	NO	Norway
EA	Euro area	NZ	New Zealand
EE	Estonia	PL	Poland
ES	Spain	PT	Portugal
FI	Finland	RO	Romania
FR	France	RU	Russia
GR	Greece	SE	Sweden
HK	Hongkong	SI	Slovenia
HR	Croatia	SK	Slovakia
HU	Hungary	TH	Thailand
CH	Switzerland	TR	Turkey
ID	Indonesia	UK	United Kingdom
IE	Ireland	US	United States
IN	India	ZA	Republic of South Africa

FINANCIAL STABILITY INDICATORS – PART 1

		2013	2014	2015	2016	2017	2018	2019 Jan.	2019 Feb.	2019 Mar.
Macroeconomic environment										
ME.1	Real GDP growth (year on year, %)	-0.5	2.7	5.4	2.4	4.5	2.9			
ME.2	Consumer price inflation (average annual index growth, %)	1.4	0.4	0.3	0.7	2.5	2.1	2.5	2.7	3.0
ME.3	General government balance / GDP (%)	-1.2	-2.1	-0.6	0.7	1.5	1.4			
ME.4	General government debt / GDP (%)	44.9	42.2	40.0	36.8	34.7	32.7			
ME.5	Trade balance / GDP (%)	4.1	5.1	4.1	5.2	5.1	4.1			
ME.6	External debt in % of banking sector external assets	149.4	152.7	133.7	120.2	114.0	112.3			
ME.7	Balance of payments current account / GDP (%)	-0.5	0.2	0.2	1.6	1.7	0.3			
ME.8	Monetary policy 2W repo rate (end of period, %)	0.05	0.05	0.05	0.05	0.50	1.75	1.75	1.75	1.75
Non-financial corporations										
NC.1	Return on equity (%)	9.5	10.5	11.0	10.6	10.7	10.4			
NC.2	Debt (% of total liabilities)	56.9	57.2	56.3	56.9	56.3	55.7			
NC.3	Credit indebtedness (% of GDP)	56.7	53.8	51.1	51.5	49.4	50.2			
NC.4	– loans from Czech banks (% of GDP)	21.2	20.3	20.0	20.4	20.2	20.4			
NC.5	– loans from Czech non-bank financial corporations (% of GDP)	4.0	4.0	4.1	4.4	4.6	4.6			
NC.6	– other (including financing from abroad, % of GDP)	31.6	29.6	27.0	26.7	24.6	25.2			
NC.7	Interest coverage (pre-tax profit + interest paid / interest paid, %)	11.4	13.4	14.5	15.4	14.6	13.9			
NC.8	12M default rate (%)	1.4	1.5	1.4	1.1	1.2	1.2			
Households (including sole traders)										
H.1	Total debt / gross disposable income (%)	56.2	56.5	57.3	59.5	61.0	60.8			
H.2	Total debt / financial assets (%)	29.5	28.8	28.4	26.4	26.2	26.6			
H.3	Net financial assets (total financial assets – total liabilities, % of GDP)	81.4	83.3	83.7	84.9	84.5	85.0			
H.4	Debt / GDP (%)	30.7	30.3	30.1	31.2	31.7	32.3			
H.5	– loans from Czech banks to households (% of GDP)	26.7	26.5	26.9	27.9	28.5	29.2			
H.6	– loans from Czech non-bank fin. corporations to households (% of GDP)	1.8	1.8	1.3	1.3	1.2	1.2			
H.7	– loans from Czech banks to sole traders (% of GDP)	0.9	0.8	0.8	0.8	0.8	0.8			
H.8	– loans from Czech non-bank fin. corporations to sole traders (% of GDP)	0.2	0.2	0.2	0.2	0.2	0.2			
H.9	– other (including financing from abroad, % of GDP)	1.1	1.1	1.0	1.0	0.9	0.8			
H.10	Net interest expenses / gross disposable income (%)	3.2	3.0	2.8	2.6	2.4	2.4			
H.11	12M default rate (%, excluding sole traders)	4.3	4.0	3.1	2.4	1.9	1.6			
Financial markets										
FM.1	3M PRIBOR (average for period, %)	0.5	0.4	0.3	0.3	0.4	1.3	2.0	2.0	2.0
FM.2	1Y PRIBOR (average for period, %)	0.8	0.5	0.5	0.5	0.6	1.5	2.2	2.2	2.2
FM.3	10Y government bond yield (average for period, %)	2.1	1.6	0.6	0.4	1.0	2.0	1.9	1.8	1.8
FM.4	CZK / EUR exchange rate (average for period, %)	26.0	27.5	27.3	27.0	26.3	25.6	25.7	25.7	25.7
FM.5	Change in PX stock index (% year on year, end of period)	-4.8	-4.3	1.0	-3.6	17.0	-8.5	-7.7	-4.4	-4.4
Property market										
PM.1	Total change in residential property prices (transaction prices, % year on year)	0.1	3.7	4.5	10.9	8.4	9.9			
PM.2	Change in apartment prices (asking prices according to CZSO, % year on year)	0.8	2.1	4.3	15.4	10.3	10.8			
PM.3	Apartment price / average annual wage	8.9	8.8	8.9	9.8	10.3	10.5			
PM.4	Apartment price / annual rent (according to IRI)	28.3	25.7	24.5	26.9	27.8	26.9			

Note: Owing to data revisions, some historical values of the indicators may not be comparable to those published in previous FSRs. Also, owing to the later date of table update, the values of the indicators may not be the same as those referred in the text of the document *Risks to financial stability and their indicators*. Missing values were unavailable at the time of preparation of the table.

FINANCIAL STABILITY INDICATORS – PART 2

		2013	2014	2015	2016	2017	2018	2019 Jan.	2019 Feb.	2019 Mar.
Financial sector										
FS.1	Financial sector assets / GDP (%)	160.5	160.0	158.0	163.3	176.2	174.3			
FS.2	Shares of individual segments in financial sector assets (%)									
FS.3	banks	78.1	77.8	77.4	77.4	78.7	78.7			
FS.4	credit unions	0.5	0.5	0.5	0.4	0.3	0.2			
FS.5	insurance companies	7.3	7.1	6.8	6.4	5.7	5.6			
FS.6	pension management companies and funds	4.7	4.9	5.3	5.2	5.0	5.1			
FS.7	investment funds*	3.8	4.3	4.8	5.2	5.4	5.5			
FS.8	non-bank financial corporations engaged in lending	5.3	5.2	5.0	5.0	4.6	4.6			
FS.9	investment firms	0.4	0.3	0.3	0.3	0.3	0.3			
Banking sector										
BS.1	Bank assets / GDP (%)	125.5	123.1	119.0	125.0	138.7	137.3			
BS.2	Assets structure (%, end of period)									
BS.3	loans to central bank	12.9	13.0	16.0	21.5	32.8	31.6			
BS.4	interbank loans	9.1	6.5	4.5	3.8	0.4	0.6			
BS.5	client loans	50.0	50.7	51.8	50.8	45.3	46.7			
BS.6	bond holdings	21.7	22.5	20.8	18.1	13.5	13.6			
BS.7	– government bonds	15.8	16.2	14.1	11.4	7.9	8.2			
BS.8	– Czech government bonds	14.6	14.8	12.5	10.0	7.0	7.4			
BS.9	other	6.3	7.3	6.9	5.9	8.1	7.5			
BS.10	Liabilities structure (%, end of period)									
BS.11	liabilities to central bank	0.0	0.1	0.2	0.2	0.3	0.2			
BS.12	interbank deposits	11.3	10.3	7.4	10.2	16.2	15.1			
BS.13	client deposits	67.8	66.3	65.9	65.2	61.2	62.8			
BS.14	bonds issued	8.3	8.6	11.9	11.5	11.1	10.9			
BS.15	other	12.5	14.7	14.6	13.0	11.2	11.0			
BS.16	Client loans / client deposits (%)	73.8	76.4	78.6	77.9	74.0	74.4			
BS.17	Sectoral breakdown of total loans (%)									
BS.18	non-financial corporations	34.5	33.2	33.1	33.1	33.1				
BS.19	households	43.4	43.3	44.4	45.1	46.6				
BS.20	sole traders	1.5	1.3	1.3	1.2	1.3				
BS.21	others (including non-residents)	20.6	22.1	21.2	20.6	19.0				
BS.22	Growth in loans (%, end of period, year on year):									
BS.23	total	6.5	4.8	5.6	6.0	4.6				
BS.24	non-financial corporations	3.8	0.9	5.3	6.0	4.7				
BS.25	– real estate activity (NACE L)	6.3	3.6	5.6	12.1	-1.7				
BS.26	households	4.5	4.5	8.2	7.7	8.0				
BS.27	– loans for house purchase	5.2	5.6	8.0	8.4	9.0				
BS.28	– loans for consumption	0.4	-0.6	8.9	4.5	4.1				
BS.29	sole traders	1.0	-4.0	0.0	4.4	10.1				
BS.30	Non-performing loans / total loans (%):									
BS.31	total	5.9	6.1	5.8	4.8	4.0				
BS.32	non-financial corporations	7.2	6.7	5.7	5.2	4.2				
BS.33	households	5.0	4.7	4.0	3.2	2.5				
BS.34	– loans for house purchase	3.3	3.1	2.6	2.0	1.8				
BS.35	– loans for consumption	12.2	12.0	11.1	8.9	6.0				
BS.36	sole traders	13.0	12.6	11.0	8.6	6.7				
BS.37	Coverage of non-performing loans by provisions (%)	55.0	55.6	54.6	57.2	54.8	58.5			
BS.38	Capital ratio (%)	17.1	18.0	18.4	18.4	19.3	19.6			
BS.39	Tier 1 capital ratio (%)	16.5	17.5	17.9	17.9	18.7	19.1			
BS.40	Leverage (assets as a multiple of Tier 1)	14.4	13.7	13.3	13.9	15.3	15.2			
BS.41	Leverage ratio (Tier 1 capital / total exposures)	n.a.	n.a.	n.a.	7.2	6.7	6.7			
BS.42	Return on assets (%)	1.3	1.2	1.2	1.2	1.1	1.1			
BS.43	Return on Tier 1 (%)	18.6	16.8	16.7	17.7	16.9	17.5			
BS.44	Quick assets / total assets (%)	30.6	31.0	32.0	34.4	41.9	41.2			
BS.45	Quick assets / client deposits (%)	45.6	46.4	48.3	52.8	68.4	65.6			
BS.46	Net external position of banking sector (% of GDP)	2.5	0.6	-2.2	-7.8	-21.4	-20.3			
BS.47	Banking sector external debt / banking sector total assets (%)	12.6	14.5	16.0	18.8	25.8	24.7			

Note: Owing to data revisions, some historical values of the indicators may not be comparable to those published in previous FSRs. Also, owing to the later date of table update, the values of the indicators may not be the same as those referred in the text of the document *Risks to financial stability and their indicators*. Missing values were unavailable at the time of preparation of the table.

FINANCIAL STABILITY INDICATORS – PART 3

		2013	2014	2015	2016	2017	2018	2019 Jan.	2019 Feb.	2019 Mar.
Non-bank financial corporations										
NI.1	Share in financial sector assets (%)	21.0	21.5	21.9	21.8	21.0	20.8			
	Insurance companies									
NI.2	Premiums written / GDP (%)	3.8	3.6	3.3	3.1	3.0	3.0	3.0		
NI.3	Ratio of eligible own funds to the solvency capital requirement (in %)	n.a.	n.a.	n.a.	238.1	230.0	229.4	225.7	260.5	
NI.4	Change in financial investment of insurance companies (%, year on year)	1.3	2.2	-1.6	0.9	4.2	-0.5	-0.8	5.3	
NI.5	Return on equity of insurance companies (%)	16.7	16.4	17.0	15.7	14.7	15.9	18.4	14.7	
NI.6	Claim settlement costs / net technical provisions (life, %)	17.7	20.0	17.8	15.1	14.4	14.3	14.1	14.1	
NI.7	Claim settlement costs / net technical provisions (non-life, %)	54.6	51.5	55.6	58.1	59.4	59.5	57.7	57.8	
	Pension management companies (PMCs) and PMC funds									
NI.8	Change in assets of funds managed by PMCs (%)	8.4	14.1	10.0	7.8	10.8	5.6			
NI.9	Nominal change in value of assets of PMC funds	-0.1	3.3	1.0	0.3	3.6	-1.7			
	Investment funds									
NI.10	Growth in net assets (= equity; year on year, %)	20.5	19.6	18.5	17.7	20.9	17.9	16.6	13.1	
	Non-bank financial corporations engaged in lending									
NI.11	Growth in loans from non-bank financial corporations engaged in lending (%):									
NI.12	total	-4.1	3.3	0.8	8.9	8.2	4.1			
NI.13	households	-2.3	5.0	-26.4	7.0	0.7	-2.0			
NI.14	non-financial corporations	-4.4	3.7	11.4	10.1	10.0	5.8			

Note: Owing to data revisions, some historical values of the indicators may not be comparable to those published in previous FSRs. Also, owing to data revisions and the later date of table update, values of the indicators may not be the same as those referred in the text of this document.

ADDITIONAL INFORMATION ON THE INDICATORS

ME.6	Total external debt in % of external assets held by MFIs and the CNB.
PM.1	Property prices based on the House Price Index, source: CZSO
PM.2	Apartment prices based on data from Společnost pro cenové mapy, s.r.o , apartment size 68 m^2.
FS.7	Act No. 240/2013 Coll., on Management Companies and Pension funds, was adopted in 2013, introducing the term "investment funds". Investment funds comprise collective investment funds and funds for qualified investors.
BS.25	Real estate activities (NACE L) comprise above all the activities of lessors, agents or brokers in the area of selling or purchasing property, renting property and the provision of other services related to property.
BS.37	Loans provided by the Czech Export Bank and the Czech-Moravian Guarantee and Development Bank were excluded from the calculation.
BS.44 - BS.45	Assets readily available to cover liabilities. They comprise cash and claims on central banks, claims on credit institutions and other clients payable on demand and bonds issued by central banks and general government.
NI.2 - NI.7	These indicators comprise domestic insurance companies (excluding the EGAP) and branches of foreign insurance companies.
NI.2	Premiums written include total gross premiums written for 12 months by domestic insurance companies including branches of foreign insurance companies (excluding EGAP).
NI.9	Change in the assets of pension funds adjusted for contributions and benefits.
NI.13	The change in the amount of loans provided to households by non-bank financial corporations engaged in lending in 2015 was due to the conversion of one of these lenders into a foreign bank branch.

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